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Christian Eduardo Castro Silva

PHARMACISTS' CLINICAL ACTIVITIES AND IMPACT ON THE CARE OF INCARCERATED PEOPLE AT CORRECTIONAL SETTINGS: A SCOPING REVIEW

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Undergraduate Thesis in Pharmacy course from the Faculty of Pharmaceutical Sciences of University of São Paulo.

Advisor:
Prof. Marília Berlofa Visacri, PhD

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In Brazil, the majority of the incarcerated population is represented by the black community. As a black person, I dedicate this thesis to all the inmates who did not have the chance to receive humane treatment and who suffered from the low quality of health care provided, in the hope that someday all human beings will have the true right to health care.

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Finally, and most importantly, I would like to thank myself. Only you (I) know what we have had to deal with to reach this point. It was, it is, and it will be a burden, but I am learning to cope with the weight.

“Prisons do not disappear social problems, they disappear human beings. Homelessness, unemployment, drug addiction, mental illness, and illiteracy are only a few of the problems that disappear from public view when the human beings contending with them are relegated to cages.”

Angela Davis

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LIST OF ABBREVIATION

AIDS - Acquired Immune Deficiency Syndrome

AUD - Alcohol Use Disorder

DAA - Direct-acting Antivirals

HbA_{1c} - Glycated Hemoglobin

HBV - Hepatitis B Virus

HCP - Healthcare Provider

HCV - Hepatitis C Virus

HIV - Human Immunodeficiency Virus

IDF - International Diabetes Federation

LILACS - Latin American and Caribbean Health Sciences Literature

MMT - Methadone Maintenance Therapy

OTC - Over-the-counter [medication]

PRISMA-ScR - Preferred Reporting Items for Systematic reviews and Meta-Analyses statement for Scoping Reviews

SUD - Substance Use Disorder

UNAIDS - Joint United Nations Programme on HIV and AIDS

USA - United States of America

WHO - World Health Organization

ABSTRACT

SILVA, CEC. **Pharmacists' clinical activities and impact on the care of incarcerated people at correctional settings: a scoping review protocol**. 2024. no. 50. Undergraduate Thesis in Pharmacy Course – Faculty of Pharmaceutical Sciences – University of São Paulo, São Paulo, 2024.

Keywords: incarcerated population; pharmacist; pharmaceutical services; review.

INTRODUCTION: There are around 11 million people incarcerated worldwide. Due to social vulnerability and the issues surrounding the correctional system, this population is more susceptible to infectious diseases (such as HIV/AIDS, HCV, and tuberculosis) and the development of noncommunicable chronic conditions (including diabetes mellitus, hypertension, and mental disorders). As part of the healthcare team, pharmacists can provide clinical services to help inmate-patients achieve optimal health outcomes while minimizing the risk of harm. **OBJECTIVE:** To map and synthesize the evidence regarding the clinical activities provided by pharmacists and their impact on outcomes of care for incarcerated individuals in correctional settings. **MATERIALS E METHODS:** This scoping review was conducted following the recommendations of the PRISMA-ScR. The search was conducted in PubMed, Scopus, and LILACS databases up to July 30, 2024. Gray literature was explored (Google Scholar), and references of included articles were also reviewed. Articles focusing on pharmacists' clinical activities in correctional facilities were selected, excluding survey studies, book chapters, dissertations and thesis, editorials, literature reviews, guidelines, papers published before 2000, and if written in languages other than English or Portuguese. Using the Rayyan QCRI software, duplicates were removed, and a first screening was conducted by two assessors independently reviewing titles and abstracts, followed by a second screening involving full-text reviews, with all disagreements resolved by the advisor. For each included article, data such as author, year, clinical activities, and the pharmacists' impact were extracted. **RESULTS:** The literature search identified 894 studies, leading to the inclusion of 20 articles published from 2010 to 2023 that met the criteria for this review. All the articles included originated from high-income countries, with most articles were from the USA (65%), and some from Canada, France, and Ireland. The studies primarily involved correctional settings, at any level of structure or territorial and administrative organization, with varying population profiles, primarily adult males. Health issues focused on infectious diseases like HIV/AIDS and HCV, as well as chronic conditions such as diabetes, and mental disorders. Pharmacists conducted various clinical activities, notably medication management and patient education. Fourteen studies reported positive outcomes related to pharmacists' roles in identifying drug interactions and advising on treatments. The impact of pharmacists on care outcomes was significant, demonstrating improvements in patient health and treatment effectiveness. **CONCLUSION:** This scoping review highlights the role of pharmacist on the care of the incarcerated population, focusing on medication management, patient education, and collaborative practice. Pharmacist-led interventions improved health outcomes for incarcerated individuals, particularly for conditions like diabetes and HIV/AIDS, similar to those in non-incarcerated populations. It emphasizes the need for more research in low- and middle-income countries and on women's health issues and other prevalent conditions in prisons.

1. INTRODUCTION

Globally, around 11 million people are incarcerated, with the largest populations found in the United States (1,808,100), China (1,690,000), and Brazil (850,377).[1] The incarcerated population has significantly increased across almost every continent in the last twenty years.[1] This population is socially vulnerable, as many prisoners face inadequate living conditions in facilities with structural problems, overcrowding, low-quality or insufficient food, and limited access to healthcare.[2,3] These factors increase their susceptibility to developing diseases or exacerbating pre-existing conditions.[3] The right to health must be guaranteed to this population, regardless of the crimes committed, as it is fundamentally a human rights issue.[3]

Compared to the general population, the incarcerated population in correctional settings is more vulnerable to various infectious and communicable diseases, including tuberculosis, viral hepatitis, syphilis, and HIV/AIDS.[4,5] Additionally, many individuals suffer from chronic conditions such as hypertension, diabetes, and mental disorders.[4] Substance use disorders and withdrawal also frequently affect prisoners.[4,5] In the light of this, correctional facilities should offer at least a basic, humane, and adequate level of healthcare services accessible to inmate-patients 24 hours a day.[6]

Despite policy efforts, correctional facilities often have underdiagnosed patients, leading many conditions untreated and uncontrolled.[7] Exacerbating the situation, limited access to appropriate treatments is also a reality. Studies reveal an underuse of medications in this population, ranging from 1.9 to 5.5 times less, depending on the condition, compared to the general population.[8,9] Due to this scarcity, some patients tend to seek alternative ways to obtain medications, such as relying on family members, which can potentially lead to a lack of knowledge among the healthcare team regarding the treatments. This may even result in patients going without medication, adversely affecting their health outcomes.[10]

As a member of the healthcare team, pharmacists can provide pharmacist services in various settings, particularly for vulnerable populations, including those incarcerated. It is recommended that all correctional facilities secure the services of a pharmacist.[6] However, in some settings, particularly in underfunded correctional facilities or in low- and middle-income countries, pharmacists are not present in prisons.[11] When pharmacists are present, they face various challenges. Pharmacists often have limited contact with incarcerated individuals and

must work in pharmacy facilities with poor infrastructure and scarce resources, including insufficient access to necessary medications. These limitations further complicate their ability to perform daily duties effectively.[11]

Thus, pharmacists often find themselves limited to the technical and logistical aspects of pharmacy.[12] Nonetheless, pharmacists play a key role in direct patient care of the incarcerated population. Correctional pharmacists could be dedicated to helping inmate-patients achieve optimal health outcomes while minimizing the risk of harm.[6] There is a literature review published in 2019 that identified the roles of pharmacists in prisons; however, it is a narrative review that does not focus on characterizing clinical activities or evaluating the impact of pharmacists on the care of incarcerated individuals.[12]

2. OBJECTIVE

To map and synthesize the evidence regarding the clinical activities provided by pharmacists and their impact on outcomes of care for incarcerated individuals in correctional settings.

3. MATERIALS AND METHODS

This scoping review was conducted following the recommendations of the Preferred Reporting Items for Systematic reviews and Meta-Analyses statement for Scoping Reviews (PRISMA-ScR)[13].

3.1. Search strategies

A comprehensive literature search was conducted in the PubMed, Scopus, and Latin American and Caribbean Health Sciences Literature (LILACS) databases for studies published up until July 30, 2024. Additionally, the gray literature was explored through Google Scholar (limited to 100 entries, excluding patents and citations). The complete search strategies for all databases are detailed in Appendix A. Furthermore, references from all included articles were reviewed to identify any studies that may have been missed.

3.2. Study selection

Articles were eligible for inclusion if they focused on clinical activities provided by pharmacists to incarcerated individuals in any type of custodial correctional facility. Survey studies, books/book chapters, dissertations and thesis, editorials, conference proceedings or abstracts, literature reviews, and guidelines were excluded. Articles not available or published before the year 2000, as well as those written in languages other than English or Portuguese, were also excluded.

The manuscripts retrieved from the databases were allocated to the Rayyan QCRI web program[14] to exclude duplicate files, analyze the titles and abstracts of the articles, and analyze complete articles whose abstracts were previously selected. The author and other reviewer independently reviewed the titles and abstracts of all studies identified by the searches, followed by a review of full texts. Disagreements were resolved by the advisor. When it was not possible to obtain the full text, the corresponding authors were contacted via email or through the Researchgate platform (www.researchgate.net).

3.3. Data extraction and analysis

For each included article, the following information was extracted: author, year of publication, country, publication type, study design, setting, population, clinical activities provided by pharmacists, and impact of pharmacists on outcomes of care of inmate-patients in a correctional setting.

The author carried out the data extraction and analysis using a preformatted spreadsheet in Microsoft Excel, while the advisor reviewed the extracted data for accuracy and consistency.

Following the PRISMA-ScR guidelines[13], no methodological quality (risk of bias) assessment was performed as scoping reviews aim to identify all the available evidence and highlight its main characteristics, regardless of the quality of such evidence. The results of this scoping review are presented as a narrative and tabular synthesis.

4. RESULTS

4.1. Search results

The electronic search found 894 potentially relevant studies. After removing duplicates and reviewing the titles and abstracts, 58 articles were selected for full-text reading. After careful full-text screening, 20 articles[15-34] met the inclusion criteria and were included in the review. Additionally, no relevant studies were identified from searching the reference lists of the included studies or other literature reviews related to the theme. A flowchart of the literature search is shown in Fig. 1.

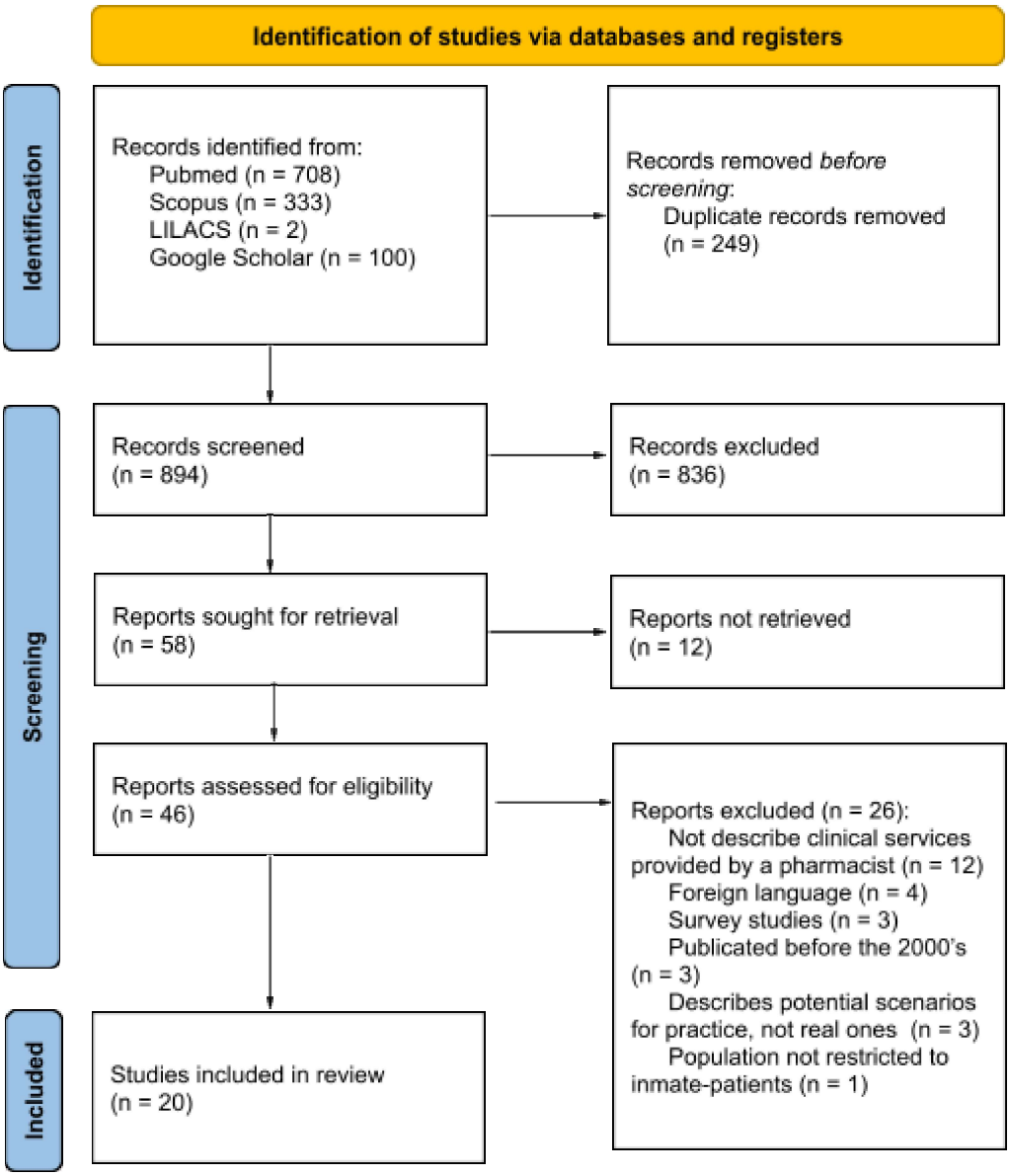

Figure 1. Study selection flowchart through literature search.

4.2. Characteristics of the articles

All the included articles were published between 2010 and 2023. Most of the articles in this review originated from the USA (65%; n = 13), followed by Canada and France (15%; n = 3 each), and Ireland (5%; n = 1). Most of the studies were research/original articles (70%; n = 14), followed by reports (20%; n = 4) and short/brief reports (10%; n = 2). The authors described the study designs in different ways, but all were descriptive or analytical observational studies, meaning there were no randomized controlled trials.(Table 1).

As part of the inclusion criteria for this study, all the settings were limited to correctional facilities, prisons, or jail units. The facility levels varied, with some studies focusing on single-building jails (25%; n = 5), others on multi-building or complexes (15%; n = 3), and the majority on city, province, state, or federal jails (60%; n = 12), typically in the context of evaluating program development and outcomes. Two of these articles also involved collaborations with universities. It is worth mentioning the telehealth clinics presented in two studies (Table 1).

The population profiles in the articles varied, reflecting the different study objectives. However, 8 (40%) articles reported exclusively male populations, while only 1 (5%) focused on a female-only population. Mixed-gender populations were mentioned in 3 (15%) articles, but the proportion of females was low, representing less than 20% (16.7%, 15.5%, and 11%) in each. The remaining 7 did not provide on the patients' gender. Furthermore, the most prevalent health issues in the populations studied were mental health concerns and substance use disorders (n = 7; 35%), followed by infectious diseases, such as HIV/AIDS, HCV, and HBV, which were the focus of five studies (25%). Regarding chronic diseases, excluding mental disorders, diabetes mellitus was the only condition with dedicated studies, being the central subject in four articles (20%). Anticoagulation treatment was discussed in three articles (15%), two (10%) of which focused on it as the main theme. One article addressed chronic noncancer pain management (5%). Another one evaluated antibiotics prescriptions (5%). There is also an article reporting recently admitted patients, without a specific condition/disease evaluation (5%).

4.3. Synthesis of results on clinical activities provided by pharmacists

The pharmacist carried out several clinical activities, as detailed in Table 1, often in conjunction with logistical and technical duties. Managing medication regimens (including identifying drug interactions, adverse effects, and recommending modifications) was the most commonly performed activity by the correctional pharmacist (70%; n = 14). Among these fourteen studies, eight (40%) reported the pharmacist's autonomy to prescribe and/or deprescribe medications, four of which indicated that they operated under a collaborative practice agreement with physicians. In addition to managing medication regimens, the pharmacist has proven to be a valuable resource for patient education, as the professional responsible for providing information about medications, drug regimens, and sometimes about diseases and even nutrition in 10 articles (50%).

The medication expertise linked to the pharmacist provided this professional with the opportunity to participate in multidisciplinary collaborative groups and meetings aimed at improving patient outcomes (40%; n = 8). Additionally, serving as part of the primary care team, whether leading telehealth or in-person clinics, allowed the pharmacist to perform consultations, visits, or appointments with patients in five articles (25%). The studies also described a correctional pharmacist's role in ordering and monitoring laboratory tests (35%; n = 7), monitoring vital sign parameters (10%; n = 2), referring patients to other health care providers (10%; n = 2), and supervising and managing patients in self-directed treatments (5%; n = 1).

Table 1. Characteristics of the included articles in this scoping review.

Authors (year)	Country	Article type	Study design	Setting	Population	Clinical services and/or activities provided by pharmacists
Badowski and Nyberg (2012)	USA	Report	Descriptive study	University of Illinois - Chicago. All 28 state prisons in Illinois.	Patients with HIV/AIDS incarcerated across 28 adult correctional facilities (n = 700).	The infectious diseases pharmacist collaborates with infectious diseases physicians and case managers in a multidisciplinary telemedicine clinic. Their responsibilities include providing drug information to patients, educating patients about their medication, addressing medication adherence, documenting the patient's medication history and allergy information, managing drug interactions, identifying and managing medication adverse effects, and recommending alternative antiretroviral therapy when necessary.
Barnes et al. (2013)	USA	Report	Descriptive study	Baylor Women's Correctional Institution	Women with a diagnosis of type 1 or type 2 diabetes mellitus who met at least one of the following criteria: HbA1c > 9%, fasting blood glucose > 240 mg/dL, or lack of prior participation in a diabetes education group. Additionally, they met at least two of the following criteria: blood pressure > 130/80 mmHg, dyslipidemia, chronic kidney disease, or obesity with a BMI > 30 kg/m².	Conducting an 8 weeks education group focused on information about diabetes, interpretation of disease values and parameters, signs, symptoms, and behaviors associated with hypoglycemia or hyperglycemia, long-term complications of diabetes nutrition, antidiabetic medication, etc.

Authors (year)	Country	Article type	Study design	Setting	Population	Clinical services and/or activities provided by pharmacists
Bingham (2012)	USA	Research Article	Descriptive study	Federal Bureau of Prisons	Patients with HIV (n = 58 as of August 2005; n = 135 as of January 2006).	Conducting consultations for patients with HIV. Activities included changing medication regimens, ordering follow-up labs, adjusting medication doses, initiating or managing antiretroviral therapy, decreasing pill burden, and treating adverse events.
Bingham and Mallette (2016)	USA	Research Article	Descriptive study	Federal Bureau of Prisons	Patients attending pharmacist-run diabetes clinics (n = 126).	Collaborate with physicians to achieve better diabetes outcomes for patients by providing education and individualized counseling, monitoring parameters, ordering and interpreting laboratory tests, prescribing medications, and implementing changes to drug treatment.
Bhat et al. (2020)	Canada	Original Article	Retrospective electronic chart review	Edmonton Remand Center	Patients admitted to the Edmonton Remand Center within 48 hours, who were at least 18 years old and had been assessed by a pharmacist (n = 518; 34.5% of the total patients).	Order monitoring parameters (laboratory and/or vital sign exams), intervene in drug therapy, and collaborate with other health care providers.
Cabelguenne et al. (2018)	France	Original Article	Retrospective study	Prisons in Lyon	All patients were male adult inmates who had been using BZD as anxiolytics or hypnotics for at least three months and were under psychiatric follow-up (n = 1249).	Collaboration with psychiatrists to review BZD prescriptions after they are made and before administration, along with meetings to develop common guidelines.
Cronin, Ryan, and Lyons (2014)	Ireland	Report	Retrospective cohort study	Mountjoy Prison Complex (excluding Dochas Women's Prison)	Patients in SSD of MMT (n = 416)	While dispensing methadone, pharmacists served as supervisors and managers for the patients in SSD.

Authors (year)	Country	Article type	Study design	Setting	Population	Clinical services and/or activities provided by pharmacists
Davoust et al. (2016)	France	Short Research Report	Prospective observational study	Jail of Marseille	Male patients diagnosed with type 2 diabetes mellitus (n = 30), with 15 of these patients participating in the medication-focused workshop group (mean age 49.3 ± 10.8 years) and 15 in the control group (patients who chose other workshops, such as those on diet or physical activity; mean age 48.7 ± 13.9 years).	Leading workshops on diabetes education, with a focus on antidiabetic medications and their management.
Dawson et al. (2023)	Canada	Original Research	Prospective case series	Correctional Services Canada institutions in British Columbia	Male patients on long-term use of NSAIDs for chronic non-cancer pain (n = 53, mean age of 53 ± 11 years, mean number of medications taken of 6.6).	Appointments with patients to conduct medication review, identify drug-related problems, deprescribe pain medications, and provide patient education. Collaborate with physicians to discuss cases and propose interventions.
Denning (2011)	Canada	Report	Case report	Toronto Jail	Male patients at Toronto Jail undergoing methadone treatment.	As logistic practices, the pharmacist of this unit manages the supply of medications and administers the methadone dispensation program. Additionally, clinical activities include providing pharmaceutical care to inmates with complex medical conditions, monitoring the charts of inmates undergoing methadone treatment, and identifying potential medication interactions, recommending changes in pharmacotherapy as necessary.
Dong et al. (2017)	USA	Research Article	Retrospective review	USA Federal correctional facilities; Clinician Consultation Center and Federal Bureau of Prisons	Patients with complex HIV/HBV/HCV (n = 34).	Discussion of patients' cases with a multiprofessional team provides new or additional treatment strategies, review of the pharmacotherapy, and elaborates individualized recommendations for the patients.

Authors (year)	Country	Article type	Study design	Setting	Population	Clinical services and/or activities provided by pharmacists
Lerat et al. (2011)	France	Original Article	Retrospective study	Lyon's prison	Male patients using BZD (n = 473: 222 in the control group [before guidelines], with a mean age of 33 years, and 251 in the intervention group [after guidelines]), with a mean age of 35 years. In the control group, 75 patients were in the drug dependence subgroup and 147 patients were in the mental disorder subgroup. In the intervention group, 95 patients were in the drug dependence subgroup and 156 patients were in the mental disorder subgroup.	Through collaboration between psychiatrists and pharmacists, BZD prescribing guidelines were developed. The pharmacist then participated in monthly staff meetings with psychiatrists to evaluate psychotropic drug prescriptions, focusing on appropriate drug regimens, treatment duration, and the detection of drug–drug interactions.
Leung, Colyer, and Zehireva (2021)	USA	Original Article	Descriptive study	Cermak Health Services of Cook County (CHS). Cook County Jail.	Patients who received naloxone training from pharmacists during their previous incarceration and had documented proof of receiving the naloxone kit prior to discharge (n = 60; 50 male and 10 female).	Provide education on the correct use of the naloxone nasal spray kit to the patients.
Lin et al. (2021)	USA	Research Article	Pre-post study	Pharmacist-led diabetes clinic at the Twin Towers Correctional Facility and Men's Central Jail.	Male patients diagnosed with type 2 diabetes mellitus, treated solely with oral antidiabetic medications (n = 240, with mean age of 52 years [range = 40-64] and mean BMI of 34.9 ± 12.0 kg/m^2).	Diabetes education, adherence evaluation, and adjustment of medication treatment regimens (initiation, modification, and discontinuation of oral antidiabetic and cholesterol-lowering medications) were carried out through a collaborative practice agreement with physicians. The pharmacists also ordered and interpreted laboratory tests as well as initiated referrals to medical providers.

Authors (year)	Country	Article type	Study design	Setting	Population	Clinical services and/or activities provided by pharmacists
Long, LaPlant, and McCormick (2017)	USA	Research Article	Descriptive study	Federal Bureau of Prisons (focused on one unidentified institution with a strong active program; others eight unidentified institutions were used for comparison).	Patients with an antibiotic prescription.	Leading the antimicrobial stewardship program beside the clinical director; analyze all antibiotics prescriptions before dispensing, and in case of any divergence from the guideline, suggest alternate treatments or seek for clarification with the prescriber; and other interventions as identify medications interactions.
Masuda et al. (2023)	USA	Research Article	Nonrandomized retrospective cohort study	Virginia Department of Corrections Facilities. Virginia Commonwealth University.	Patients who had not received previous treatment for HCV, with HCV genotypes 1 to 6, without HIV infection, and without decompensated liver disease (n = 1040; average age of 42.7 years and range of 22 to 76 years; male = 880; female = 161)	Lead a telemedicine clinic focused on HCV treatment, responsible for conducting non-presential consultations with patients to manage their medication regimens, including making changes if necessary; providing patient education; checking for potential drug interactions; attending follow-ups until the end of treatment to ensure its success; and collaborating with other healthcare providers to discuss cases.
Mathis and O'Reilly (2010)	USA	Research Article	Descriptive study	Maryland Division of Correction's Eastern Correctional Institution	Patients on warfarin therapy (n = 12).	In a collaborative practice agreement with the medical director, the pharmacist leads the anticoagulation point-of-care service, evaluates drug interactions and metabolic changes that may influence warfarin levels, monitors and tests patients' INR, and prescribes or adjusts warfarin doses, while also provides patient education. Additionally, collaborates with a multidisciplinary team.

Authors (year)	Country	Article type	Study design	Setting	Population	Clinical services and/or activities provided by pharmacists
Muradian et al. (2021)	USA	Research Article	Descriptive study	ADU in the Los Angeles County jail	High-risk male patients undergoing alcohol detoxification with severe withdrawal symptoms (n = 282; 22% of total patients admitted to the ADU).	Performing withdrawal assessments and starting, modifying, and discontinuing withdrawal medication therapy in a collaborative practice agreement with a physician. Additionally, the pharmacist was responsible for initiating referrals to a substance use disorder counselor and providers.
Patel (2023)	USA	Brief Report	Descriptive study	Federal Correctional Center Butner	Male patients followed by a psychiatric pharmacist (n = 125, all diagnosed with schizophrenia, with or without additional mental health disorders, such as bipolar disorder or major depression).	A pharmacist, under a collaborative practice agreement, conducted mental health clinical visits, monitored narrow therapeutic index medication laboratory test results, performed movement disorder testing, and executed antipsychotic psychoeducation meetings with other healthcare professionals and inmate patients. Three additional pharmacists also conducted metabolic monitoring to minimize cardiovascular risk in patients prescribed antipsychotics.
Tran et al. (2021)	USA	Research Article	Descriptive study	Pharmacist-led anticoagulation clinic at the Los Angeles County jail	Patients undergoing warfarin treatment with a target INR of 2 to 3 (n = 116; 89% male and 11% female; 67% using warfarin for the treatment of deep vein thrombosis or pulmonary embolism).	Working under a collaborative practice agreement, the pharmacist was authorized to initiate, adjust, or discontinue anticoagulation therapy and order relevant laboratory tests, while also providing patient education.

Abbreviations: Acquired Immune Deficiency Syndrome (AIDS), Alcohol Detox Unit (ADU), Benzodiazepines (BZD), Body Mass Index (BMI), Cermak Health Services of Cook County (CHS), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Human Immunodeficiency Virus (HIV), International Normalized Ratio (INR), Methadone Maintenance Therapy (MMT), Nonsteroidal Anti-inflammatory Drugs (NSAIDs), Self-directed Detoxification (SSD), United States of America (USA).

4.4. Impact of pharmacists on outcomes of care

The impact of correctional pharmacists on care outcomes in the incarcerated population is detailed in Table 2. Denning (2011) was the only article included that did not describe any outcomes,[24] while all other nineteen studies had at least one category of outcome reported. Among the nineteen studies, process outcomes were reported in thirteen articles, followed by ten articles with clinical outcomes, demonstrating the role of pharmacists in providing better health results and treatment effectiveness. Additionally, focusing on patient experience and opinions, four studies presented humanistic outcomes. Lastly, two studies reported economic outcomes associated with pharmacists' practices.

Table 2. Impact of pharmacists on outcomes of care.

	Outcomes			
Article	**Process**	**Clinical**	**Humanistic**	**Economic**
Badowski and Nyberg	The telemedicine clinic helps unify treatment policies for HIV/AIDS patients and enhances continuity of care. When patients are transferred to another Illinois state prison, they can still access the same telemedicine clinic. The multidisciplinary team, specialized in infectious diseases, played a crucial role in ensuring patient safety, improving prescribing practices, and managing complications associated with HIV. The pharmacist contributed significantly by reducing the pill burden and administration frequency, improving medication adherence, and identifying drug interactions and toxicities.			
Barnes et al.		One year after the program began, there was an average HbA_{1c} decrease of 1.6%. Among the patients who completed the training, 78% reduced their HbA_{1c} values, and 22% of the patients achieved an HbA_{1c} below 8%.	Inmates felt empowered through the knowledge of how to control their diabetes. They also felt confident to start teaching new inmates about diabetes management, transforming the trainees into trainers.	
Bingham	As of January 2006, 135 cases were reviewed, resulting in 206 interventions, including the initiation of antiretroviral therapy.	An increase in the undetectable HIV viral load from 32% in July 2004 to 53% in October 2005.		
Bingham and Malette	A 217% increase in pharmaceutical collaborative practice agreements occurred (from 35 in March 2012 to 111 in September 2015). The number	There was an average decrease of 2.3% points in HbA_{1c} (mean baseline HbA_{1c} of 10.6%) and a significant mean decrease in the		

	of pharmacists also increased by 141% during this period (from 29 pharmacists in March 2012 to 70 pharmacists in September 2015). Adherence to HIV medications showed a rise of 14% after the implementation of the collaborative practice agreements (from 47 patients out of 56 to 55 patients out of 56).	clinic with the highest average baseline HbA_{1c}, from 11.5% to 7.8% (a decrease of 3.7% points). The number of patients in anticoagulation treatment with the INR at goal increased by 94% (from 68 patients to 132 patients). HIV patients also showed better outcomes after pharmacist-led clinic programs, with a 54% increase in patients with viral loads below 200 (from 35 patients to 54 patients) and a 65% increase in patients with viral loads below 20 (from 26 patients to 43 patients). Additionally, the number of patients with CD4 counts above 200 cells/mm3 increased by 29% (from 35 patients to 45 patients).
Bhat et al.	As the data show, 511 (98.6%) of the 518 patients assessed by a pharmacist received at least one intervention, with a median of 3 interventions per patient. Most of the interventions were referrals (73.0%), the majority of which were to a psychiatrist. Changes in drug therapy also made up a significant portion of the interventions. Medication reconciliation and prescription were the most commonly provided pharmacotherapy-related services, accounting for 52.3% and 25.4%, respectively. Interactions with healthcare providers regarding seamless care represented 47.7% of all interventions.	
Cabelguenne et al.	Comparing the most recent year included in the study (2016) with the	

	control group (2000), which represents the period before the pharmacotherapy program (collaboration between psychiatrists and pharmacists), the mean dose of BZD decreased by 31% (from 42 mg in DE in 2000 to 29 mg in DE in 2016; $p < 0.001$). The group receiving co-prescription of OMT (buprenorphine or methadone) also showed a significant mean daily dose reduction of 39% (from 54 mg in DE in 2000 to 33 mg in DE in 2016; $p < 0.05$).		
Cronin, Ryan, and Lyons	Out of 416 patients in SDD, 49% (202) decreased their MMT dose by 20 mls or more, and 51% (214) were completely detoxified from methadone. Of the patients who detoxified completely from methadone, 63% (134) chose to use courses of lofexidine to complete the SDD; 37% (80) did not use lofexidine but completed the SDD with pharmacist support; and 13% (27) relapsed temporarily or went back on MMT.		
Davoust et al.		After 3 months, the HbA_{1c} levels of patients who participated in the medication-focused workshop decreased compared to the control group, with a mean reduction of 1.18%, while the control group showed a mean increase of 0.26% ($p < 0.001$).	Learning objectives were set for patients to self-evaluate their experience before and after the workshop (on a scale from 0 to 5). The average score for identifying their diabetes medication increased by 77.4% (from 2.2 to 4.2; $p < 0.05$), and the score for the rational use of drugs to ensure safety and effectiveness increased by 78.8% (from 2.6 to 4.5; $p <$

			0.05). All participants considered themselves ‘satisfied’ or ‘very satisfied’ with the workshops.
Dawson et al.	In the beginning, 37 patients were using oral nonsteroidal anti-inflammatory drugs (NSAIDs). After 3 months, 12 of these patients had their medication deprescribed, representing a 32.4% reduction. At the start, 23 of the 53 patients were using topical NSAIDs, and the same percentage was maintained after 3 months. However, for 17 of these patients, there was a reduction in the concentration of diclofenac gel (from 10% diclofenac to 2.32% diclofenac). A total of 153 drug-related problems were reported by the pharmacist, with subsequent interventions for pain management in 51 of the patients. All interventions proposed by the pharmacist were accepted by the primary care physician.		A satisfaction survey was made available to the patients, and 58.5% (31 patients) completed it. Of the 31 respondents, 77% (24) agreed that the pharmacist visit improved their overall health and well-being. Additionally, 97% (30) agreed that the pharmacist provided education that helped them achieve their therapy goals, and 87% (27) felt that the pharmacist also helped them understand those goals. Regarding help with taking medications safely and correctly, 100% (31) acknowledged the pharmacist's impact, and 93% (29) agreed that the pharmacist helped them understand the purpose of their medications.
Dong et al.	Change in the antiretroviral regimen occurred in 87.5% (28) of the cases.	Of the 28 adaptation suggestions, 89% (25) resulted in a favorable viral load response, 64% (18) achieved complete virologic suppression, and 25% (7) showed a significant reduction in viral load.	
Lerat et al.	When all patients were considered, the mean daily dose of BZD in diazepam equivalents was higher in the control group (46 mg vs. 34 mg; p = 0.000), representing a 26% dose reduction. Patients in the intervention		

	group with a mental disorder diagnosis presented lower daily doses of BZD, with a 37% dose reduction compared to the control group (p = 0.000). However, no significant difference was found between drug dependence patients in the control group and those in the intervention group.	
Leung, Colyer, and Zehireva		The study evaluated the view of reincarcerated patients about naloxone nasal spray kit education during previous incarceration. 48.3% (29) of them related to had prior knowledge of naloxone; 83.1% (49) stated that the training in CHS offered informations that they did not have before; 93.3% (58) showed confidence to use naloxone nasal spray kit after the CHS training; 38.3% (23) stated use of the medication after discharge from CHS; 70% (42) reported educating family and friends on the proper use of naloxone spray in a event of an overdose; 89.1% (49) related the naloxone spray being more convenient than naloxone injections; 31% disclosed feeling safer with the disponibility of naloxone, but were less likely to stay drug-free; 22.4% (13) reported that they would like more education on methadone, naloxone etc.

Lin et al.	Improvement in medication adherence, as measured by patient self-report, pill count, and medical administration record review). Statin therapy was initiated in 50.4% of the 141 patients who were not on statin therapy at baseline, increasing compliance with guidelines.	Improvement in glycemic control and a reduction in the mean HbA_{1c} from 8.2% to 7.6% ($p < 0.001$). Patients with the highest HbA_{1c} showed more significant changes, with a reduction of 3.1% ($p < 0.001$).
Long, LaPlant, and McCormick	Comparisons were made between the fiscal years 2010 and 2015. Across all BOP institutions, the number of antibiotic prescriptions decreased by 25.94% (from 142,907 in 2010 to 105,832 in 2015); the number of antibiotic prescriptions per 1,000 inmates decreased by 24.61% (from 829 in 2010 to 625 in 2015); a decrease was also seen in the percentage of antibiotic prescriptions relative to all prescriptions, from 7.64% in 2010 to 5.84% in 2015; regarding gender, the number of antibiotic prescriptions per 1,000 patients decreased by 23.95% in the male population (from 789 in 2010 to 600 in 2015) and by 29.53% in the female population (from 1,395 in 2010 to 983 in 2015). Focusing on the one institution with a strong implementation of the program, a 48.62% decrease (from 1,016 in 2010 to 522 in 2015; $p < 0.05$) in the number of antibiotic prescriptions per 1,000 patients was observed, the highest reduction compared to the other eight institutions. The number of pharmacist interventions appears to be related to the decrease in antibiotic prescriptions, as the	

	number of interventions decreased following fewer antibiotic prescriptions.		
Masuda et al.	During these period, the pharmacist follow-up was important to monitor adverse effects and drug interactions, at the fourth week follow-up, most common side effects reported by patients were headaches, tiredness, nausea, and, in a few cases, skin irritation; 4 patients (1 male and 3 females) reported an extreme abdominal discomfort, but no patient discontinued the DAA therapy due to side effects. Most of the drug interactions management were made in patients using proton pump inhibitors, 25.7% (267) in total, by holding the use of them during twelve weeks or administering 12 hours after the DAA dos; followed by the HMG-CoA reductase inhibitors therapy, that needed management in 5,9% (61) of the HCV-positive patients, who treatment was holded during the DAA regimen or the dose were reduced to a third, reaching to reduce the risk of myopathy and rhabdomyolysis. Some patients received interventions in other classes of medications as antiepileptics (2%; 20 patients), anticoagulants (0,4%; 4 patients), and cardiac agents (0,2%; 2 patients.	At fourth week follow-up, 2% (20) of patients presented only trace amounts of viral load, and were cleared as evidenced at the twelfth week follow-up. Because of the patients released before finishing the treatment or after finishing but had not achieved the SVR12 (22 out of 1040 and 12 out of 1040, respectively), the cure rate was at 96.7% (1006).	The cost-to-cure found in this study was $23,223 per person, which is lower than those reported in the literature (ranging from $74,380 to $189,900 per person; however, the literature reference does not provide a direct comparison to this specific study).
Mathis et al.		At the start of the program, 50% of the patients were in the desired INR range (6 out of 12 patients). After 12 weeks, this value increased to 66.7% of the patients in the desired	

		INR range (8 out of 12 patients). During the same period, 79 readings with the new equipment were taken, guaranteeing a better control of INR levels.	
Muradian et al.	Better management of alcohol withdrawal syndrome was achieved by identifying patients at high risk, resulting in the transfer of 48 patients to an acute care facility. Referrals were made for 163 patients to a substance use counselor and for 73 patients to a medical and/or mental health provider. Additionally, 180 pharmacotherapy changes were made for 148 patients.	None of the patients died.	
Patel	Of the total inmate patients who had previously declined psychiatric medication, 43% consented to begin treatment after participating in the antipsychotic psychoeducation meeting. The pharmacist conducted laboratory tests for narrow therapeutic index medications, performed AIMS testing, and completed clozapine REMS for 100% of patients. Metabolic monitoring was completed 80% of the time.	74% of patients experienced stable or improved symptoms of schizophrenia, bipolar disorder, or depression. Adverse effects, particularly psychiatric-related movement disorders, were closely managed.	576 psychiatric pharmacists' visits demonstrate an annual salary cost savings of $151,000 compared to the cost if the service were provided by a psychiatrist.
Tran et al.		Over the 8 months analyzed, the average percentage of INR readings within the therapeutic range was 74.1% with new patients and 80.2% without new patients, while the target for good control is defined as over 65% of INR readings in the range. The INR values obtained during the study period showed that 68% were within the therapeutic	

	range, 20% were subtherapeutic, and 12% were supratherapeutic. The average time in the therapeutic range also demonstrated good results, at 67%, with values above 65% defined as a good control parameter. Additionally, 71.3% of patients had a time in the therapeutic range equal to or above the good control reference value. There were no hospitalizations related to thrombosis or bleeding events over the 8 months of the study. There was a 5% increase (from 76.3% to 81.3%) in the mean INR readings within the therapeutic range for established patients (without new patients) from the initial month to the final month of the study period.	

Abbreviations: 12-Week Sustained Virological Response (SVR12), Abnormal Involuntary Movement Scale (AIMS), Acquired Immune Deficiency Syndrome (AIDS), Benzodiazepines (BZD), Cermak Health Services of Cook County (CHS), Diazepam Equivalents (DE), Direct-acting Antivirals (DAAs), Federal Bureau of Prisons (BOP), Healthcare Provider (HCP), International Normalized Ratio (INR), Methadone Maintenance Therapy (MMT), Nonsteroidal Anti-inflammatory Drugs (NSAIDs), Opioid Maintenance Therapy (OMT), Risk Evaluation and Mitigation Strategies (REMS), Self-directed Detoxification (SSD).

5. DISCUSSION

5.1. Summary of evidence

The main findings highlighted the pharmacist's crucial role in correctional multidisciplinary teams, managing patients' drug regimens, monitoring health parameters, providing patient education and training, and contributing significantly to reducing pill burden and the improvement of medication adherence. Impacts on process, clinical, economic, and humanistic outcomes were observed with the integration of this professional into the primary care health team. It is worth noting that the humanistic outcomes were related specifically to patient satisfaction with the service, without reflecting patients' perceptions of improvements in quality of life. During the research, we also found another literature review focused on the role of clinical pharmacists, however, as a narrative review, it did not focus on characterizing these clinical activities or their impact on the health of inmate-patients.[12]

5.2. General view of the studies

This study included 20 articles published between 2010 and 2023. All of the included articles originated from high-income countries, such as the USA, Canada, France, and Ireland. Of the 20 studies included, only one article did not describe how the clinical pharmacist's activities impacted care outcomes. It was a case report in which a pharmacist described her personal duties in a setting where pharmacists were initially designated only for logistical and technical activities.[24] We also noted some studies evaluating from an indirect perspective, through data analysis of results from national programs implemented by the USA Federal Bureau of Prisons. Some articles presented confusing data, which could be an exclusion criterion if quality standards were applied to this research.

We believe there are diverse factors associated with the concentration of studies in this field in Global North countries. Some of these factors could include the lack of epidemiological reports on various diseases, especially in low- and middle-income countries,[35] as well as the absence of evaluations regarding governance or policy data related to the healthcare of the incarcerated population. These limitations hinder the search for and planning of interventions in this field.[36]

The expenditure per prisoner is also an important factor to consider. The USA, Canada, France, and Ireland spend $29,978, $49,251, $44,410, and $68,019, respectively,

annually per inmate. In contrast, middle-income countries like India, South Africa, and Brazil spend $5,900, $22,412, and $3,814, respectively, annually per inmate. Particularly regarding the value invested in healthcare, the expenditure difference is more striking, with Ireland spending the most ($27,207), followed by South Africa ($8,964), the USA ($5,396), and India ($1,180). The percentage of expenditure per inmate allocated to healthcare was not reported for France, Canada, and Brazil.[37,38] Additionally, the pharmacist's role in clinical activities is not structured in many countries, as seen in Brazil, where the National Health Plan for the Penitentiary System from 2005 describes the functions of this professional solely within the scope of pharmaceutical assistance, with this professional performing only a medication selection role.[39]

5.3. Key findings on care outcomes

5.3.1. Diabetes mellitus

According to the International Diabetes Federation (IDF), in 2021, there were 537 million adults (20-79 years old) living with diabetes worldwide, with projections that this number will rise to 783 million by 2045. Also according to the IDF, 3 in 4 adults living with diabetes are from low- and middle-income countries.[40] In the USA alone, the prevalence of diabetes mellitus in the general adult population was estimated to increase from 9.8% to 12.4% between 1988-1994 and 2011-2012, respectively.[41] Rolling et al. found that individuals involved in the criminal justice system were 15% ($p = 0.015$) more likely to receive a diabetes mellitus diagnosis compared to those not involved in the system, with income and level of education being risk factors for both populations.[42]

A person with uncontrolled diabetes mellitus is subject to many complications, such as ketoacidosis, retinopathy, neuropathy, nephropathy, and macrovascular complications.[43] Thus, the findings of this review highlight the impact pharmacists have on inmate-patients with diabetes, helping them achieve better disease control, such as lowering HbA_{1c} levels closer to the target for good glycemic control [16,18,28] (guidelines recommend a $HbA_{1c} < 7.0\%$).[44,45] In the four studies included in this review that reported diabetes outcomes, the average reduction in HbA_{1c} was 2.38%,[16,18,22,28] a value higher than that found in some literature analyzing pharmacist-led collaborative care of patients with type 2 diabetes (literature reduction values of 1.5%, [46] and 0.46% [47]). However, these results are not directly comparable, considering the differences in interventions, patient profiles, and some specific details that were not evaluated.

5.3.2. Infectious diseases

Based on Joint United Nations Programme on HIV and AIDS (UNAIDS) reports, in 2021, 37.7 million people were living with HIV worldwide. In the same year, 1.5 million people were newly infected with HIV, and 680,000 died from AIDS-related diseases. The report also indicates that 28.2 million people had access to antiretroviral therapy.[48] Regarding HCV, according to the WHO, in 2021, an estimated 58 million people were infected globally, with approximately 1.5 million new cases and 290,000 deaths attributed to HCV infection.[49]

Another UNAIDS report highlights that 4.2% of the global incarcerated population is HIV-positive, 15.4% are infected with HCV, and 4.8% with chronic HBV. The incarcerated population has a 7.2 times higher risk of living with HIV than the general population, primarily due to interruptions in treatment during admission, transfer, or release,[50] as well as exposure to risk factors like injectable drug use with reused syringes or unprotected sexual activity.[51,52]

This review has shown how pharmacists positively influence antiretroviral therapy and direct-acting antiviral (DAA) adherence, along with the process and clinical outcomes of care derived from their activities, such as prescription and deprescription under collaborative practice agreements, patient appointments, and management of drug interactions.[15,18,25,30] Similarly, Ahmed et al. also reported an increase in CD4 counts (in seventeen articles; $p = 0.95$), a decrease in viral load (in thirteen articles; $p = 0.11$), and improvements in adherence outcomes (in eighteen articles; $p = 0.03$) following pharmacist interventions.[53] Additionally, one article highlighted pharmacist-led patient education and counseling focused on HIV and HCV, combined with point-of-care tests, which resulted in better outcomes, particularly in reducing transmission rates.[54] Another article on a collaborative protocol between pharmacists and physicians reported improved treatment efficacy and a reduction in adverse events.[55]

5.3.3. Mental disorders and substances abuse

Throughout the articles included in this review, two focused on mental disorders and their treatment. These described pharmacists' interventions resulting in a reduction of BZD doses,[20,26] which is a highly beneficial outcome considering the risks associated with this class of medications, such as drowsiness, impaired concentration, memory loss, and the potential for dependence.[56] Another article discussed mental health, where the pharmacist, working under a collaborative practice agreement, improved treatment acceptability among inmates

through patient education, with patients achieving stable or improved symptoms in conditions like schizophrenia, bipolar disorder, and depression.[33] Pharmacist-led prescriptions have also shown significant results, including a reduction in psychiatric emergency service visits, a finding aligned with those reported in this review.[57,58]

Additional examples of clinical and psychiatric pharmacist involvement in collaborative care programs can be found in the literature, showing improvements in post-traumatic stress disorder outcomes at six and twelve months ($p=0.002$, and $p=0.04$ respectively) and positive response and/or remission in depression.[59]

Despite these promising results, more detailed data is needed to better analyze clinical outcomes and the cost-benefit of pharmacists' roles in mental health, along with expanded opportunities for pharmacist training and involvement in this area.[60,61]

Mental disorders are risk factors for both substance use disorder (SUD) and alcohol use disorder (AUD), and vice versa.[62] Three studies included in this review reported substance abuse cases. One described a successful SDD of MMT, where the pharmacist played a supportive role; another focused on patient education about naloxone spray in opioid abuse cases; and the third highlighted alcohol withdrawal, with the pharmacist playing a key role in better managing the withdrawal syndrome.[21,27,32]

Current literature supports these findings by emphasizing the pharmacist's role in harm reduction strategies for individuals with SUD. Pharmacists can address stigma, recognizing that not all patients are ready to treat their abuse disorder. Their activities can include dispensing naloxone, providing sterile injection supplies, and offering education about safe injection practices, withdrawal crises, and overdose events.[62-64] Moreover, the success of MMT is noted as an effective tool in preventing infectious diseases associated with injection drug use in prisons.[51]

Although not extensively discussed in the articles reviewed, an important potential role for pharmacists is managing abstinence syndrome, where patients exhibit signs and symptoms following substance use discontinuation.[65] To mitigate these crises, pharmacists can conduct medication reconciliation, ensuring that current pharmacotherapies address both SUD and AUD at the time of admission or transfer. By doing so, and under collaborative practice agreements, pharmacists can identify treatment gaps, assist in selecting appropriate medication regimens, and prevent the incorrect use of medications.[53]

5.4. Health of women inmates

Reflecting the minority status of female inmates in the incarcerated population (0.8 million women versus 10.9 million men in 2019),[66] female prisoners are underrepresented in the articles reviewed, with only one study focusing on a women's correctional facility.[16] Conversely, the number of female inmates is rising, and their needs can overlap with, but also differ from, those of male inmates.[66,10] This data reinforces the need to develop studies focused on the pharmacist's role in women's health, pregnancy in prison, and newborn health management.

In one study of 36 women aged 20 to over 60 years undergoing medical treatment, medications acting on the central nervous system were predominant, including 28 prescriptions for antidepressants, antipsychotics, and antiepileptics. Anti-hypertensive medications were the second most common, with 15 prescriptions.[10] Another article analyzed the clinical issues reported by correctional patients, highlighting differences between men and women. For women, the most frequent issues were musculoskeletal problems (55.8%), cardiovascular (18.8%), and genitourinary disorders (14.3%). In men, cardiovascular issues (19.6%) were most common, followed by musculoskeletal (11.7%), respiratory/allergic conditions (5.9%), and endocrine disorders (5.9%).[67]

Despite these findings, female inmates require focused attention on issues significantly related to incarceration. Drug abuse prevalence is higher among women than men, yet treatment options are more limited for female inmates.[51] Incarcerated women are also five times more likely to be HIV-positive than women in the general population.[50] And just as related before, the clinical pharmacist could play an important role in managing these conditions, such as substance abuse, mental health disorders, and infectious diseases.[53,57,58,62-64] As shown in Ribeiro et al., female inmates are predominantly affected by hypertension,[10] a finding not reported for male inmates in the studies reviewed. The literature highlights pharmacists assisting with hypertension management in other settings through follow-up programs. In one study, female inmates demonstrated lower adherence to treatment compared to men, but significant improvements in blood pressure control were achieved with proper intervention for both. [68]

5.4.1. Pregnancy and motherhood in prison

In the context of incarceration, women experience significant loneliness and exclusion from their partners and families compared to men. This situation reflects societal gender roles and the level of judgment surrounding criminal behaviors.[69] This feeling of loneliness is also evident among pregnant incarcerated women, who globally represent 5% to 10% of the incarcerated female population,[70] and is often accompanied by concerns for their well-being and that of their child. These mothers report low levels of support during this critical period and face situations such as being housed with women who have a history of violence, receiving inadequate nutrition tailored to their specific health conditions (such as gestational diabetes or anemia), and encountering difficulties accessing antenatal care due to complicated administrative processes.[71]

A systematic review identified additional healthcare needs among incarcerated mothers, including care during labor and delivery, postpartum care, management of HIV-positive pregnant women, and strategies to prevent vertical transmission to the fetus. The review also emphasized the importance of addressing substance abuse issues, including MMT and addiction withdrawal planning.[72] Regarding the health of children born in this context, a review reported an increased risk of infant mortality compared to infants without an incarcerated parent and highlighted potential impacts on physical development.[73]

According to what has been stated, this review found that pharmacists can play a significant role in managing HIV and substance abuse among various patient profiles,[15,17,18,21,30] and that these services could also benefit inmate mothers, aiming for better health outcomes. In addition, literature reports clarify some areas of community pharmacist involvement with pregnant women that could be applied to the inmate population. Some activities provided by pharmacists associated with pregnancy include managing short-term pregnancy-induced ailments, such as nausea and reflux, with over-the-counter (OTC) medications; recommending vitamins and food supplements; providing contraception advice; offering weight control guidance; making referrals to physicians; supporting adherence to folic acid prescriptions; and conducting telephone consultations to educate patients about medication and nutrition.[74-77] The last service described has been noted as particularly appreciated by women, as it aligns with their desire to be more involved in decision-making throughout their pregnancy, thereby reinforcing the role of the pharmacist in patient education.[77]

5.5. Telehealth as an alternative

It is known that most prisons and correctional facilities are located in remote areas, often in rural regions far from urban centers. These buildings are frequently placed in locations such as postindustrial or contaminated sites.[78-80] However, despite the issues associated with these locations, one article reported that some remote prisons, particularly those situated in green spaces, showed a positive influence on inmate rates of self-harm and violence.[81] Furthermore, healthcare providers tend to be more numerous in urban areas than in rural ones, as shown by 2020 USA data: rural areas had 5.1 primary care physicians per 10,000 residents, while urban areas had 8.0. Similarly, the number of dentists was 4.7 in rural areas compared to 7.6 in urban areas, and other healthcare professionals numbered 11.1 in rural areas compared to 14.7 in urban areas.[82]

After the COVID-19 pandemic, patients' use of telehealth services increased substantially (from 11% in 2019 to 46% in 2022). Due to this rapidly changing scenario, healthcare professionals had to adapt to meet the demand, with federal and state regulations expanding the activities permitted through telehealth.[83] As highlighted in one of the included articles, a telemedicine-based approach can help standardize consultations, procedures, and care protocols across more facilities, while also enhancing healthcare continuity despite inmate transfers between correctional institutions.[15]

The literature reports positive health and clinical outcomes in pharmacist-led telehealth services for various conditions such as hypertension, asthma, anticoagulation treatment, depression, and diabetes mellitus.[84] In one pharmacist-led diabetes control program, 28 adults with diabetes and HbA_{1C} >8% received telephonic pharmacist interventions combined with telemonitoring over 16 weeks. Pharmacists provided tailored medication and lifestyle recommendations based on in-home device data. Results showed significant reductions in HbA_{1C} (from 9.8% at baseline to 8.5% after 16 weeks; p=0.001) and fasting blood glucose (from 178 mg/dL at the baseline to 163 mg/dL after 16 weeks; p = 0.0002), although no significant change in patient activation levels was observed.[85]

Connecting these findings, telehealth emerges as a potential solution for cases where pharmacists face difficulty accessing certain locations to provide healthcare,[86] including to incarcerated populations. As demonstrated positively in this review, partnerships with universities to involve students in pharmacist care could be expanded to correctional settings. Collaboration between correctional facilities and pharmacy faculties could create a telehealth model to improve inmate access to pharmaceutical care, requiring only basic structures like telephone-based services.[15,30,83]

5.7. Limitations

The limitations of this review include the fact that the quality of the included articles was not evaluated using any established quality protocol, which means that low-quality evidence in some studies may have gone undetected. Additionally, the clinical activities provided by the pharmacist were not assessed with tools like Descriptive Elements of Pharmacist Interventions Characterization Tool (DEPICT),[87] resulting in less consistent information about these services. Finally, the exclusion criteria for language and year of publication may have led to the omission of articles that could offer new insights on this topic, and some studies may have been missed because they were not indexed in the databases searched.

6. CONCLUSION

This scoping review identified the role of pharmacists in healthcare for the incarcerated population in correctional settings through the analysis of 20 eligible articles. The principal clinical activities performed by pharmacists were related to medication regimen management and patient education, often under collaborative practice agreements that allowed them to prescribe and deprescribe medications when necessary. It is important to emphasize that the involvement of pharmacists in multidisciplinary teams and pharmacist-led interventions positively impacted process, clinical, humanistic, and economic outcomes of care.

The present study also revealed that outcomes for incarcerated individuals with diseases such as diabetes mellitus and HIV/AIDS, following pharmacist interventions, were similar to those for non-incarcerated populations also receiving pharmacist care. This finding highlights that despite the numerous challenges in treating incarcerated individuals, the dedication of healthcare professionals makes a significant difference. Furthermore, many incarcerated individuals face barriers to healthcare, food access, and medication storage before incarceration. Despite their limitations, jails can provide resources that lead to better clinical results.

Future research in this field is needed, particularly in low- and middle-income countries, to create comparable scenarios with existing studies focused on high-income countries, serving as models for similarly structured nations. Additionally, we encourage researchers to conduct more studies involving female inmates and women's health issues, as

well as to focus on the management of prevalent health issues within the prison population that were not addressed in the included articles, such as hypertension, tuberculosis, and syphilis.

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8. APPENDICES

APPENDIX A - Search strategies

Electronic Bibliographic Databases	Search Strategy
Pubmed	#1 "Prisoners"[Mesh] OR Prisoner* OR “Imprisoned Individual*” OR Inmate* OR “Incarcerated Individual*” OR Hostage* OR “Detained Person*” OR “Incarcerated population*” OR “Imprisoned population*” OR Convict OR “Incarcerated Offender*” OR "Prisons"[Mesh] OR Prison* OR Penitentiar* OR “Correctional facilit*” OR “Correctional institution*” OR Jail* OR “Correctional setting*” OR “Correctional site*” OR “Correctional institution*” OR “Correctional center*” OR “Detention center*” OR Jailhouse* OR “Correctional complex*” OR “Incarceration facility*” OR “Penal institution*” OR Lockup* #2 "Pharmacists"[Mesh] OR Pharmacist* OR "Clinical Pharmacist*" OR "Community Pharmacist*" OR "Hospital Pharmacist*" OR "Pharmacies"[Mesh] OR Pharmacy OR Pharmacies OR "Community Pharmacy" OR "Community Pharmacies" OR "Pharmacy Distribution*" OR "Pharmacy Service, Hospital"[Mesh] OR "Hospital Pharmacy Service*" OR "Hospital Pharmaceutical Service*" OR "Clinical Pharmacy Service*" OR "Community Pharmacy Services"[Mesh] OR "Community Pharmacy Service*" OR "Community Pharmaceutic Service*" OR "Community Pharmaceutical Service*" OR "Pharmaceutical Services"[Mesh] OR "Pharmaceutic Service*" OR "Pharmaceutical Service*" OR "Pharmacy Service*" OR "Pharmaceutical Care" OR Telepharmacy OR "Telepharmacy Service*" OR "Remote pharmacy" OR “Remote dispensing” OR “Virtual pharmacy” OR “Digital pharmacy” OR “Online pharmacy” OR E-pharmacy OR Telepharmaceutic* OR "Medication Therapy Management"[Mesh] OR "Medication Therapy Management" OR "Drug Therapy Management" OR "Comprehensive Medication Management" OR "Medication Management" OR "Medicines Management" OR "Pharmacotherapeutic follow-up" OR "Medicines Optimisation" OR "Medication Review"[Mesh] OR "Medication Review*" OR "Drug Dispensing" OR "Drug Monitoring"[Mesh] OR "Drug Monitoring" OR "Therapeutic Drug Monitoring" OR "Medication Reconciliation"[Mesh] OR "Medication Reconciliation*" OR "Drug Information Services"[Mesh] OR "Drug Information Service*" OR "Drug Storage"[Mesh] OR "Drug Storage*" OR "Drug Supply" OR "Drug Supplies" #1 AND #2
LILACS	MH:Prisoners OR Prisoner* OR “Imprisoned Individual*” OR Inmate* OR “Incarcerated Individual*” OR Hostage* OR “Detained Person*” OR “Incarcerated population*” OR “Imprisoned population*” OR Convict OR “Incarcerated Offender*” OR MH:Prisons OR Prison* OR Penitentiar* OR “Correctional facilit*” OR “Correctional institution*” OR Jail* OR “Correctional setting*” OR “Correctional site*” OR “Correctional institution*” OR “Correctional center*” OR “Detention center*” OR Jailhouse* OR “Correctional complex*” OR “Incarceration facility*” OR “Penal institution*” OR Lockup* AND MH:Pharmacists OR Pharmacist* OR "Clinical Pharmacist*" OR "Community Pharmacist*" OR "Hospital Pharmacist*" OR MH:Pharmacies OR Pharmacy OR Pharmacies OR "Community Pharmacy" OR "Community Pharmacies" OR "Pharmacy Distribution*" OR MH:"Pharmacy Service, Hospital" OR "Hospital Pharmacy Service*" OR "Hospital Pharmaceutical Service*" OR "Clinical Pharmacy Service*" OR MH:"Community Pharmacy Services" OR "Community Pharmacy Service*" OR "Community Pharmaceutic Service*" OR "Community Pharmaceutical Service*" OR MH:"Pharmaceutical Services" OR "Pharmaceutic Service*" OR "Pharmaceutical Service*" OR "Pharmacy Service*" OR "Pharmaceutical Care" OR Telepharmacy OR "Telepharmacy Service*" OR "Remote pharmacy" OR “Remote dispensing” OR “Virtual pharmacy” OR “Digital pharmacy” OR “Online pharmacy” OR E-pharmacy OR

	Telepharmaceutic* OR MH:"Medication Therapy Management" OR "Medication Therapy Management" OR "Drug Therapy Management" OR "Comprehensive Medication Management" OR "Medication Management" OR "Medicines Management" OR "Pharmacotherapeutic follow-up" OR "Medicines Optimisation" OR MH:"Medication Review" OR "Medication Review*" OR "Drug Dispensing" OR MH:"Drug Monitoring" OR "Drug Monitoring" OR "Therapeutic Drug Monitoring" OR MH:"Medication Reconciliation" OR "Medication Reconciliation*" OR MH:"Drug Information Services" OR "Drug Information Service*" OR MH:"Drug Storage" OR "Drug Storage*" OR "Drug Supply" OR "Drug Supplies"
SCOPUS	TITLE-ABS-KEY(Prisoner* OR “Imprisoned Individual*” OR Inmate* OR “Incarcerated Individual*” OR Hostage* OR “Detained Person*” OR “Incarcerated population*” OR “Imprisoned population*” OR Convict OR “Incarcerated Offender*” OR Prison* OR Penitentiar* OR “Correctional facilit*” OR “Correctional institution*” OR Jail* OR “Correctional setting*” OR “Correctional site*” OR “Correctional institution*” OR “Correctional center*” OR “Detention center*” OR Jailhouse* OR “Correctional complex*” OR “Incarceration facility*” OR “Penal institution*” OR Lockup*) AND TITLE-ABS-KEY(Pharmacist* OR "Clinical Pharmacist*" OR "Community Pharmacist*" OR "Hospital Pharmacist*" OR Pharmacy OR Pharmacies OR "Community Pharmacy" OR "Community Pharmacies" OR "Pharmacy Distribution*" OR "Hospital Pharmacy Service*" OR "Hospital Pharmaceutical Service*" OR "Clinical Pharmacy Service*" OR "Community Pharmacy Service*" OR "Community Pharmaceutic Service*" OR "Community Pharmaceutical Service*" OR "Pharmaceutic Service*" OR "Pharmaceutical Service*" OR "Pharmacy Service*" OR "Pharmaceutical Care" OR Telepharmacy OR "Telepharmacy Service*" OR "Remote pharmacy" OR “Remote dispensing” OR “Virtual pharmacy” OR “Digital pharmacy” OR “Online pharmacy” OR E-pharmacy OR Telepharmaceutic* OR "Medication Therapy Management" OR "Drug Therapy Management" OR "Comprehensive Medication Management" OR "Medication Management" OR "Medicines Management" OR "Pharmacotherapeutic follow-up" OR "Medicines Optimisation" OR "Medication Review*" OR "Drug Dispensing" OR "Drug Monitoring" OR "Therapeutic Drug Monitoring" OR "Medication Reconciliation*" OR "Drug Information Service*" OR "Drug Storage*" OR "Drug Supply" OR "Drug Supplies") AND NOT DOCTYPE("ab" OR "bk" OR "ch" OR "bz" OR "cp" OR "cr" OR "dp" OR "ed" OR "er" OR "le" OR "mm" OR "no" OR "pr" OR "tb" OR "re" OR "sh") OR SRCTYPE("b" OR "k" OR "p" OR "m" OR "n" OR "w" OR "l")
GOOGLE SCHOLAR	(Prisoner* OR “Imprisoned Individual*” OR Inmate* OR “Incarcerated Individual*” OR Prison* OR Penitentiar* OR “Correctional institution*” OR Jail*) AND (Pharmacist OR "Hospital Pharmacy" OR "Community Pharmacy" OR "Pharmaceutical Service*" OR "Pharmaceutical Care")

Christian E. C. Silva

Christian Eduardo Castro Silva

18/10/2024

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Marília Berlofa Visacri, PhD

18/10/2024