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Impacts of pharmaceutical care on health outcomes of patients treated in primary care: a systematic review

Impacts of pharmaceutical care on the health outcomes of patients seen in primary care: a systematic review

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SUMMARY

Pharmaceutical care is an important component of primary health care (PHC), where pharmacists ensure the rational use of medications. This review aims to analyze the impacts of pharmaceutical care on the health outcomes of PHC patients. The bibliographic portfolio consists of eight articles. Analysis of this review leads to the conclusion that pharmaceutical care can promote the reduction of clinical and laboratory parameters related to diseases such as diabetes, hypertension, and dyslipidemia.

Keywords: pharmaceutical care, pharmacotherapeutic monitoring, clinical results, primary health care, multidisciplinary team.

ABSTRACT

Pharmaceutical care is an important component of primary health care (PHC), where the pharmacist ensures the rational use of medicines. This review aims to analyze the impacts generated by pharmaceutical care on the health outcomes of patients in PHC. The bibliographic portfolio consists of eight articles. Its analysis allows us to conclude that pharmaceutical care is capable of promoting the reduction of clinical and laboratory parameters related to diseases such as DM, SAH, and dyslipidemias.

Keywords: pharmaceutical care, pharmacotherapy follow-up, clinical outcomes, primary health care, multidisciplinary team

1. INTRODUCTION

In the day-to-day practice of his profession, the pharmacist must have his actions guided to the health needs of their patients, developing interventions to identify, prevent and solve medication-related problems (DRPs) (Schütz, 2022).

This professional is part of public health by providing services directly to the patient, to family and community. For many people, pharmaceutical establishments represent the first gateway to health systems (CFF, 2016; Wiedenmayer *et al.,* 2006).

It is in pharmacotherapeutic monitoring (AFT), one of the services provided by pharmacist, the professional acts to ensure the provision of drug therapy most appropriate, effective, and safe possible. During the AFT, the professional provides information

important to the patient, in the form of health education, and creates a bond with him, empowering you regarding your treatment and generating a therapeutic relationship where the pharmacist and patient are jointly responsible for pharmacotherapeutic needs (Destro *et al.,* 2021).

In several locations around the world, the clinical work of pharmacists is encouraged and generates good results. However, in certain countries, especially developing ones and underdeveloped, the pharmacist is underutilized (CFF, 2016; Mendes *et al.,* 2022).

Little by little, pharmaceutical professionals have expanded their scope of action in healthcare primary health care (PHC). The results of clinical pharmaceutical practice should be studied, in order to serve as health indicators to support the development of public policies new and more decisive.

In this sense, the objective of this study is to highlight the impacts generated by pharmaceutical care in the health outcomes of patients treated in PHC, seeking identify the opportunities and challenges related to this topic.

2 THEORETICAL FRAMEWORK

2.1. Pharmaceutical care

As countries develop economically, there is a shift in health profile of populations, where infectious diseases and nutritional deficiencies are gradually replaced by chronic non-communicable diseases such as diabetes mellitus (DM), systemic arterial hypertension (SAH) and heart disease (Brazil, 2021).

The growing demand for medicines is deeply linked to this transition epidemiological challenge the world faces. In a scenario where self-medication is common, assistance and pharmaceutical care is essential to ensure the effective and safe use of medications, promoting adherence to treatment, educating patients and monitoring of possible PRMs (Brazil, 2015; CFF, 2016).

Pharmaceutical care is a patient-centered approach that aims to optimize the use of medicines and promote health safely and effectively (Figure 1) (CFF, 2016;

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Wiedenmayer *et al.,* 2006). By minimizing the number of hospital admissions and doctor visits, emergencies arising from avoidable DRPs, it prevents high expenses that could jeopardize the implementation of other important health actions (Wang *et al.,* 2022).

The pharmacist's activities go beyond dispensing and are divided into technical-managerial and technical-assistance activities. Technical-managerial activities are related to the cycle pharmaceutical assistance and focus on medication management. The assistance responsibilities of the pharmacist correspond to clinical activities aimed at managing health conditions of the patient, where pharmaceutical care is inserted (Figure 2) (Destro *et al.,* 2021; Pereira; Mesquita; Castro, 2023).

Figure 1. Pharmaceutical care process

Source: CFF, 2016.

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Figure 2. Pharmacist's duties

Source: Pereira, Mesquita and Castro, 2023.

Multidisciplinary teams allow for more comprehensive and effective management of health needs, generating greater patient satisfaction and reduced utilization rates of services (Rajan *et al.,* 2024). Pascucci *et al.* (2021) conducted a systematic review to evaluate the impacts of interprofessional collaboration on chronic health conditions and verified that the work of a multidisciplinary team makes it possible to significantly reduce the levels systolic blood pressure (SBP), diastolic blood pressure (DBP), glycated hemoglobin (HbA1c), LDL cholesterol and length of hospital stay of patients.

In the publication “The role of the pharmacist in the health care system” The Organization Pan American Health Organization (PAHO), together with the World Health Organization (WHO) and the Federal Council of Pharmacy (CFF) argues that:

> At all levels of health care, the provision of services health is multidisciplinary in nature. Therefore, the health team, which is inevitably involved with the use of medications, must necessarily include a pharmacist (PAHO/WHO and CFF, 2004).

In collaboration with doctors, nurses, nutritionists and other professionals, the pharmacist brings specialized knowledge about medications, allowing a integrated and collaborative approach, where the patient is seen holistically (CFF, 2016).

2.2. Pharmaceutical care in PHC

2.2.1. The APS

PHC plays a fundamental role in a strong and well-functioning health system. developed, being the first level of contact for individuals with the local health network. When Instead of treating diseases only when they have already manifested, PHC seeks to prevent health problems. health through continuous actions and caring for people in their entirety, considering their biopsychosocial aspects (Rajan *et al.,* 2024).

The Alma-Ata Declaration, published in 1978 by the WHO and the United Nations United Nations Children's Fund (UNICEF), defined PHC as essential and highlighted that it must be universal and accessible to all individuals (WHO/UNICEF, 1978).

Since then, the concept has been interpreted and implemented in many different ways. in different global contexts, which is due, among other reasons, to its historical evolution and the ambiguity of some of its formal definitions (Mendes *et al.,* 2019; Rajan *et al.,* 2024).

The Astana Declaration, signed in 2018, reaffirmed the Alma-Ata Declaration and emphasized the importance of addressing the social determinants of health to promote primary health care in a more inclusive, effective, and equitable manner. It highlights as factors that will drive APS success: knowledge and training; human resources for health; technology and financing (WHO, 2018).

WHO defines three mutually dependent components of PHC: (1) integration of primary care services and essential public health functions; (2) policies and actions multisectoral; and (3) individual empowerment and community engagement (Figure 3) (WHO/UNICEF, 2018; Rajan *et* al., 2024).

Figure 3. PHC Components

Source: adapted from Rajan *et* al., 2024.

The first component is related to the provision of services capable of meet health needs at the individual and population level, so that services aimed at the population and those aimed at individuals (person-centered) are essentially complementary (WHO/UNICEF, 2018).

The second component deals with the multifactorial influence to which the health and well-being of people are subject. Therefore, it becomes necessary to plan policies and actions coordinates that integrate social, economic, environmental and commercial components to achieve objectives and mitigate health risks (WHO/UNICEF, 2018; Rajan *et* al., 2024).

The third component reflects social participation in planning and implementation of health actions. This engagement of people and communities occurs on three fronts: “as advocates for multisectoral health policies and actions; as co-developers of health and social services; and as self-caregivers and caregivers” (WHO/UNICEF, 2018).

Within the healthcare network (RAS), the APS must fulfill 3 essential functions: resolution, communication, and accountability. In this context, PHC must be resolute to address the vast majority of its population's problems, it must be able to organize flows and counterflows of people, products and information within the RAS and must know and closely relate to the territory and the attached population, in order to be responsible healthily for them (Mendes *et al.,* 2019).

2.2.2. The inclusion of pharmacists in PHC

It was in a hospital environment that clinical pharmaceutical services were observed initially (Brazil, 2015). In recent years, these activities have expanded to pharmacies community, including in PHC (Mendes *et al.* 2022).

In the Tokyo Declaration, resulting from a meeting organized by WHO in 1993, reflections had already been written about the pharmacist's duties in health care users and the community. The need to reorient its actions is being defended, which should focus on the patient and stop being centered on the medication (PAHO/WHO and CFF, 2004).

Incorrect use of medications can occur due to failures during the processes of prescribing, transcription, dispensing, administration and monitoring and causes great losses for health systems. According to the WHO, about 0.7% of total health expenditure worldwide are generated by medication errors, which corresponds to 42 billion dollars (WHO, 2023).

The chance of these errors occurring can be increased by aggravating factors, such as: extremes of patient age (very young and very old), multimorbidities, polypharmacy, high-alert drugs, antimicrobials and resistance, transition of care and low-quality or counterfeit medicines (WHO, 2023).

The occurrence of medication errors can be mitigated by the presence of a pharmacist who knows how to perform their clinical role in the PHC health team. Applying their knowledge specialized in pharmacology, the pharmacist can review and validate prescriptions, identify

potential drug interactions and ensure that patients receive the correct dose (CFF, 2016).

Thus, pharmaceutical care ends up generating a positive economic impact on health services, as it allows efficient management of the patient's clinical conditions within the PHC and reduces the need for more costly medical interventions, which are performed at the most complex levels of care (Melo *et al.,* 2021; Wang *et al.,* 2022).

Although many advances have been observed since the ratification of the relevance of the role of the pharmacist by WHO in the Tokyo Declaration, the consolidation of care pharmacist in PHC still faces some important challenges, including: training deficit of pharmacists centered on the biomedical model, predominance of activities of dispensation, unavailability of time, precarious physical structure and lack of autonomy within of the health team to carry out technical-assistance activities (Destro *et al.,* 2021; Mendes *et al.* 2022).

3. MATERIAL AND METHOD

3.1. Type of study

This work is a systematic review, organized according to the updated international recommendations of PRISMA *(Preferred Reporting Items for Systematic Reviews and Meta-Analyses)* and the methodological guidelines of the Ministry of Health (MS) (Brazil, 2023; Page *et al.,* 2021).

A systematic review allows the researcher to synthesize existing knowledge about a given topic from multiple primary research studies, reducing biases and identifying gaps and solid impressions to support evidence-based clinical practice (Medina; Pailaquilén, 2010). Its elaboration occurs through the synthesis and critical analysis of studies relevant scientific data in a standardized, transparent and reproducible manner (Galvão; Ricarte, 2019).

The PRISMA recommendations, first published in 2009, have been adopted by researchers around the world to transparently report methods employed in systematic reviews. In 2020, the PRISMA statement was updated with a focus in systematic reviews aimed at investigating the impacts of interventions in the area of health. This guidance incorporates methodological and terminological improvements, reflecting the advances in the identification, selection, evaluation and synthesis of studies (Page *et al.,* 2021).

Evidence-based clinical guidelines are fundamental to guiding practice clinical and health management. They are constructed from systematic literature reviews scientific, which evaluate the benefits and risks associated with different health care options health. Selecting the best evidence provides a solid scientific basis for decision-making, benefiting both health professionals and managers and patients themselves (Brazil, 2023).

3.2. Data collection

To delimit the scope of the study and guide the search for answers, the following was used: guiding question: “Does pharmaceutical care impact patients’ health outcomes? attended in the PHC?”. The bibliographic search was guided by the formulation of the acronym PICO, where P (population): patients treated in PHC, I (intervention): pharmaceutical care, C (comparators): standard care versus combination of pharmaceutical care and O (outcomes): impacts on health outcomes (Brazil, 2023; Teixeira; Lynn; Souza, 2024).

The bibliographic portfolio was built through the survey of scientific articles in the following online libraries: Virtual Health Library (VHL) - where they were selected the MEDLINE, LILACS (Latin American and Caribbean Literature on Health Sciences) and IBECS *(Spanish Bibliographic Index on Health Sciences)* databases - PubMed and SciELO *(Scientific Electronic Library Online).*

Different keyword combinations were tested to refine the retrieval of relevant information. From the consultation of descriptors in the multilingual dictionary DeCS/MeSH, the terms that returned the highest search volume and reflected the central aspects of the investigation. The following search strategies were used in the

English: *"pharmaceutical care"* AND *"primary care"* AND *"results",* and in Portuguese: "cuidado" pharmacist" AND "primary care" AND "outcomes".

3.3. Eligibility criteria

Studies that met the following inclusion criteria were selected: articles scientists who analyze clinical and laboratory health results, with publication date between 2019 and 2024, in English, Spanish or Portuguese, whose interventions were carried out by community pharmacists in PHC - including public or private community pharmacies, primary care units/basic health units (UBSs) and home visits.

The exclusion criteria for articles were: studies carried out in hospitals, nursing homes, medical specialty centers and clinics, literature reviews, studies for assessing patient and professional satisfaction, articles whose full text is was unavailable or that the results were not fully disclosed.

3.4. Selection process

The data obtained through keyword research was exported to the online platform Rayyan.ai. Articles present in more than one database were considered duplicates and deleted.

Each publication was reviewed by a single reviewer. Dynamic reading was performed title, abstract and keywords of the articles and those not aligned with the objective of the research were excluded, obtaining the raw portfolio. Finally, to filter the studies of interest for the systematic review, scientific articles were removed according to the criteria of inclusion and exclusion.

4. RESULTS AND DISCUSSION

After the dynamic reading and selection steps using the inclusion criteria and exclusion, eight articles became part of the final portfolio of this systematic review. Figure 1 presents the flowchart, according to the 2020 PRISMA recommendations (Page *et al.,* 2021), which illustrates the process of inclusion and exclusion of studies. The selected articles address the central theme of the review and were conducted with methodological quality, their characterization can be analyzed in table 1.

Figure 1. Flowchart of the article inclusion and exclusion process

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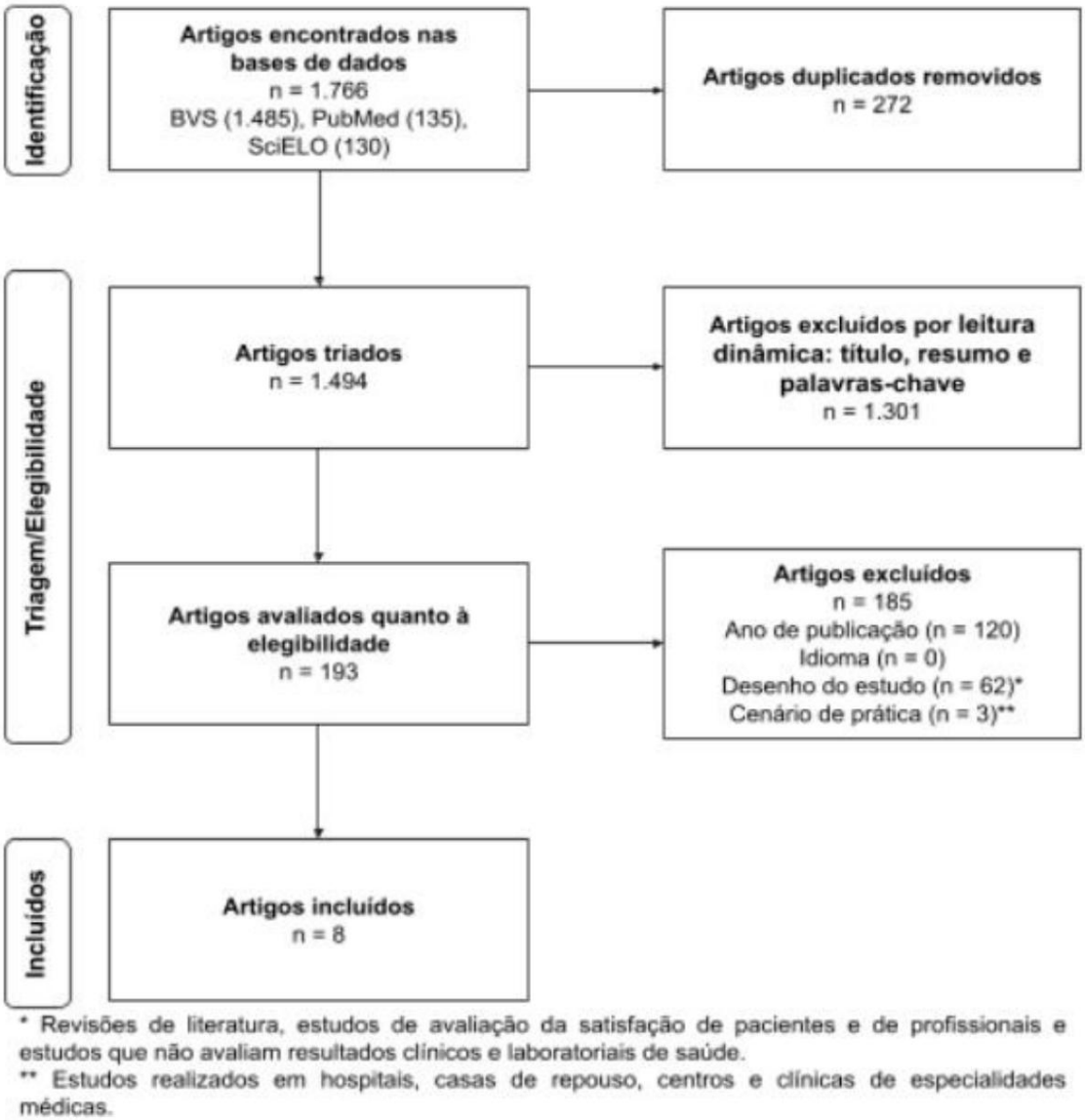

Source: Prepared by the author (2024).

Table 1. Characterization of selected articles

Authorship, year	Language, country	Type of study, practice setting	Target audience, sample	Intervention	Clinical outcomes
Abdulhim *et al.*, 2019	Eng., Qatar	Observational, DM treatment clinic	Adult patients with DM1 or DM2, n=96	AFT, medication reconciliation, drug therapy assessment and education in health	Reduction of clinical and laboratory parameters (HbA1c, fasting blood glucose, BMI, SBP and DBP)

Javaid *et* al., 2019	Eng., Pakistan	Experimental, Primary care unit	Patients with uncontrolled DM2 (HbA1c> 8%), intervention group (n=150) and control group (n=150)	AFT and health education	Reduction of clinical and laboratory parameters (HbA1c, BMI, BP, cholesterol, triglycerides and serum creatinine) and increased glomerular filtration rate
Neves *et* al., 2019	Eng., Brazil	Observational, Primary care units	Patients monitored by the pharmacist, n=90	Comprehensive Medication Management (CMM) for one clinical pharmacist	Reduction of clinical and laboratory parameters (HbA1c, SBP, DBP, LDL and HDL)
Gomes *et al.,* 2021	Eng., Brazil	Observational, Primary care units	Adult patients with hypertension for more than 6 months, n=163	Adherence assessment, AFT and education in health	94.5% did not adhere to drug therapy and 77.2% had uncontrolled symptoms. Reduction in SBP and DBP
Rosli *et al.,* 2021	Eng., Malaysia	Experimental, Homes	Adult patients with DM2 (HbA1c > 6.5%) using polypharmacy, intervention group (n=83) and control group (n=83)	Home AFT and health education	Reduction of clinical and laboratory parameters (HbA1c, DBP and cholesterol) and increased adherence rate
Firmino *et al.,* 2022	Eng., Brazil	Observational, Primary care unit	Hypertensive and/or diabetic patients, intervention group (n=109) and control group (n=115)	Home-based AFT and health education and lifestyle modification	Reduction of clinical and laboratory parameters (SBP, DBP, blood glucose and cardiovascular risk)
Roque; Ax; Kazarim, 2023	Pt. and Ing., Brazil	Experimental, Community pharmacy	Adult patients with DM and/or hypertension, n=8	AFT	Reduction in the impact of the pandemic on HbA1c, improvement in HDL levels and breaking a trend of increasing cardiovascular risk
Canadell-Vilarrasa *et al.,* 2024	Esp. and Eng., Spain	Experimental, Primary care unit	Adult patients with DM2 using antidiabetics for 10 months, n=907	Collaboration with primary care physicians to optimize pharmacotherapy	Reduction of HbA1c

Source: Prepared by the author (2024).

The final portfolio of this review is composed of four experimental studies - Javaid *et al.* (2019), Rosli *et al.* (2021), Roque, Machado and Cazarim (2023) and Canadell-Vilarrasa *et al.* (2024); and four observational - Abdulrhim *et al.* (2019), Neves *et al.* (2019), Gomes *et al.* (2021) and Firmino *et al.* (2022).

APS encompasses people- and community-centered services that act as first and main point of contact with the health system (OECD, 2020). Different terms around the world are commonly used to characterize care environments primary care, which includes community health centers, polyclinics, health posts and pharmacies community (Rajan *et al.,* 2024). The articles that make up this review had as scenarios of primary care unit/UBS practices, community pharmacy, treatment clinic diabetes and home.

Data were collected from adult patients who underwent AFT and subsequent assessment of the impacts on clinical and laboratory parameters. The average age of patients selected is 59.9 years old and the largest portion has multiple comorbidities, including hypertension, DM, dyslipidemia and obesity are the most prevalent.

The correlation between hypertension, DM and dyslipidemia derives from pathophysiological mechanisms of these comorbidities, which involve alterations in the vascular endothelium, whose dysfunction can be caused by hyperinsulinemia and the formation of atherosclerotic plaque (Martinez; Murad, 2014). The simultaneous prevalence of dyslipidemia and DM in patients with hypertension reaches to be 2 and 3 times higher, compared to those without the disease (Malta *et* al., 2017).

In five studies, the participation of patients was mostly of the same sex. female. In two other articles, the majority of individuals selected were of the male. Only in one of the surveys the number of women and men selected was the same.

Women tend to seek healthcare services more than men. Data of the last National Health Survey (PNS), carried out in 2019 by IBGE in partnership with MS and the Ministry of Economy, point out that the proportion of women (82.3%) who

had consulted a doctor in the last 12 months prior to the date of the interview was higher than that of men (69.4%) (Brazil, 2020).

This pattern is also observed in other parts of the world. In their review article, Mursa, Patterson and Halcomb (2022) highlight several barriers faced by men in access health services, such as: privacy concerns, general practice focused aimed at women and children, fear and embarrassment, breakdown of masculinity and lack of understanding of preventive health care.

Most articles do not mention other sociodemographic characteristics of individuals selected beyond age and sex. Only Gomes *et al.* (2021) and Roque, Machado and Cazarim (2023) report the race of patients. This information is relevant, since the prevalence of hypertension and DM is influenced by the race of individuals and their level of education (Dias *et* al., 2021; Moraes *et al.,* 2020).

In the articles included in this review, the interventions were carried out by pharmacists trained and included strategies such as health education and AFT, which encompasses the review of drug therapy and the identification of DRPs.

Education is a fundamental methodology in PHC for the prevention of diseases and injuries and promoting the health of the population, by fostering knowledge capable of modifying patterns of lifestyle that predisposes individuals and the community to health risks (Conceição *et al.,* 2020; Gonçalves *et al.,* 2020).

The Brazilian Diabetes Society (SBD) in its 2024 guideline encourages approaches non-pharmacological interventions for patients with DM that include health education aimed at modifications in nutritional and sleep patterns, stress management and exercise physicists (Lyra *et al.,* 2024). The 2020 Brazilian Guidelines for Arterial Hypertension advocate the same strategy, highlighting patient education as the team's action plan multidisciplinary approach to promote self-care (Barroso *et* al., 2021).

Multidisciplinary healthcare with a pharmacist on the team allows better management of chronic diseases, such as hypertension, DM and dyslipidemia, ensuring patient safety patient (Rahayu *et al.,* 2021). AFT results in interventions and recommendations that simplify the complexity of the medication regimen, increase adherence to treatment and

result in improved clinical outcomes (Abdin, Grenier-Gosselin and Guenette, 2020; CFF, 2016).

AFT differs from other pharmaceutical services by providing care continued through multiple consultations (CFF, 2016). The minimum duration of the follow-ups carried out in the selected articles was 6 months, in Rosli *et al.* (2021). The maximum duration reached 3 years and 3 months, in Roque, Machado and Cazarim (2023).

4.1. Results of experimental studies

The clinical results of the interventions carried out in the experimental studies that part of the bibliographic portfolio of this systematic review are summarized in table 1.

Javaid *et al.* (2019) conducted a randomized study in a PHC clinic in Pakistan with diabetic patients. Patients in the control group underwent medical monitoring and patients in the intervention group were referred to pharmacist after medical consultation to receive health education and advice. During the consultation, the pharmacist evaluated the prescriptions, identified DRPs and was responsible for developing an individualized intervention plan for each patient, based on the *Diabetes Self-Management* Education Criteria *Education criteria* (DSME). The authors observed significant differences in the results laboratory data of patients allocated to the intervention group from the first follow-up. After the third month of follow-up, a decrease in HbA1c, SBP, DBP, cholesterol, TG and serum creatinine values, and an increase in the filtration rate glomerular.

Rosli *et al.* (2021) developed a Randomized Clinical Trial (RCT) in Malaysia which involved home visits for AFT of patients with DM2 treated at a clinic public PHC. Patients allocated to the control group only received follow-up routine by a family doctor at the clinic. The intervention group, in addition to monitoring physician, received quarterly visits from community pharmacists, who worked on the review pharmacotherapies and provided individualized advice on adherence and

lifestyle modification. A reduction in glycemic parameters (HbA1c and fasting glucose) and DBP in the intervention group. On the contrary, in the control group there was no no significant change was observed for HbA1c, while fasting blood glucose and DBP showed an increase.

Roque, Machado and Cazarim (2023) carried out a quasi-experimental study, of the type before and after, with hypertensive and diabetic patients treated at the University Pharmacy of UFJF, Brazil. Records were collected from pre-COVID-19 pandemic medical records during the pandemic and after the return of in-person consultations. In pharmaceutical consultations, patients received medication therapy management service both before the pandemic, and after. Pharmaceutical intervention caused a reduction in HbA1c, cholesterol and TG, both in the pre-pandemic and post-pandemic periods. The results of this study also show the influence of COVID-19 on blood glucose and BP, considering that the values of HbA1c, SBP and DBP increased after the pandemic, regardless of whether it occurred or non-pharmaceutical intervention.

Canadell-Vilarrasa *et al.* (2024) produced an intervention study in Spain, of the before and after type, involving patients with DM2 treated at health centers belonging to the Primary Care Directorate Camp de Tarragona of the Catalan Health Institute. The intervention was performed on patients who did not have optimal HbA1c levels, for through a meeting of pharmacists and APS doctors to evaluate the possibility of optimization of pharmacological treatment. After 6 months, the implementation of interventions was reassessed. There was a reduction in HbA1c values after the intervention, however the authors highlight that this difference was not significant, since the relaxation of the therapeutic objective for patients who presented controlled HbA1c.

Table 1. Clinical results obtained after AFT in experimental studies

Authors, year	Clinical and laboratory markers	Clinical results [mean]			
		Control group		Intervention group	
Javaid *et al.,* 2019		Pre-intervention	Post-intervention	Pre-intervention	Post-intervention

	HbA1c (%)	10.7	9.7	11	7.7
	SBP (mm/Hg)	133	137	145	124
	DBP (mm/Hg)	85	89	94	87
	Cholesterol (mg/dL)	231	221	223	153
	TG (mg/dL)	191	172	272	143
	Creatinine serum (mg/dL)	1.0	1	1.1	0.8
	TFG [ml/min/1.73m2]	77	76	70	94
		Control group		Intervention group	
		Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Rosli *et al.,* 2021	HbA1c (%)	9.6	9.6	10.2	9.3
	Fasting blood glucose (mmol/L)	9.5	9.8	10.9	9.3
	DBP (mm/Hg)	75.7	78.6	76.3	76.3
		Pre-pandemic		Post-pandemic	
		Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Roque; Ax; Kazarim, 2023	HbA1c (%)	8.9	7.8	9.6	7.3
	SBP (mm/Hg)	117.5	128.3	134.7	133.9
	DBP (mm/Hg)	71.2	76.7	83.2	78.2
	Cholesterol (mg/dL)	187.8	172.5	185.5	173.0
	TG (mg/dL)	189.6	181.7	174.6	128.0

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		Pre-intervention	Post-intervention
Canadell-Vilarrasa *et al.*, 2024	HbA1c (%)	7.4	7.2

Source: Prepared by the author (2024).

4.2. Results of observational studies

The results of the interventions carried out in the observational studies are summarized in Table 2.

Abdulrhim *et al.* (2019) conducted a retrospective study of multiple series storms in Qatar. Patients treated at a clinic for treatment of DM. The pharmacist worked together with a nurse to perform an assessment drug therapy, medication reconciliation and health education for the patient and your family. After AFT, the values of DM markers (HbA1c and fasting glucose) and HAS (SBP and DBP) decreased significantly. However, the results indicate that the profile lipid profile of patients did not show significant change.

Neves *et al.* (2019) developed a quasi-experimental longitudinal study in two UBSs in Brazil. Data from meetings between patients and a clinical pharmacist for comprehensive medication management. The clinical impact of this service was assessed by comparing the results pre- and post-intervention laboratory tests. A significant decrease in HbA1c and clinical parameters of BP and lipid profile at the end of the follow-up period.

The study by Gomes *et al.* (2021) is descriptive and was conducted in three UBSs in Brazil. Riverside patients and those who lived in urban centers, hypertensive patients and those who were registered in the National Hypertension and Diabetes Program (Hiperdia). It was the level of adherence to therapy was determined and, subsequently, the patients were divided into 4 groups: a) controlled/adherent; b) controlled/non-adherent; c) non-controlled/adherent; and d) uncontrolled/non-adherent. Those classified in group d participated in an AFT that included health education and review of drug therapy. As a result, it was observed a significant improvement in BP, especially SBP. Furthermore, patients who live

in urban centers obtained greater benefits, with a significant increase in the number of patients with controlled hypertension and significant reduction in BP, which was not observed among participants from the riverside community.

Firmino *et al.* (2022) conducted a longitudinal and retrospective study that collected data from records of services provided to assess the impacts of pharmaceutical services provided to patients at a UBS in Brazil. Hypertensive and/or diabetics with uncontrolled BP or blood glucose levels. In the control group, patients who attended only one appointment with the pharmacist. In the intervention group patients were allocated who received complete and individualized AFT that promoted health education, detection, resolution and prevention of DRPs and encouragement of adherence. It was found it was found that SBP and DBP varied significantly between the 2 groups, with a greater decreased values in the intervention group. Similarly, DM markers (HbA1c and fasting glucose) decreased after the intervention. However, the authors highlight that the decrease in HbA1c was not statistically significant. Furthermore, a comparison between the HbA1c results between the groups is not possible, since all patients who underwent this examination were patients in the intervention group. Although it was observed decrease in cholesterol and TG levels, there was no significant difference between the values of TG.

Table 2. Clinical results obtained after AFT in observational studies

Authors, year	Clinical and laboratory markers	Clinical results [mean]	
		Pre-intervention	Post-intervention
Abdulrhim *et al.,* 2019	HbA1c (%)	8.5	7.1
	Fasting blood glucose (mmol/L)	8.6	6.3
	SBP (mm/Hg)	140.2	125.3
	DBP (mm/Hg)	84.7	76.0

	Cholesterol (mg/dL)	166.26	158.5
	TG (mg/dL)	141.7	150.6

		Pre-intervention	Post-intervention
Neves *et* al., 2019	HbA1c (%)	8.4	7.8
	SBP (mm/Hg)	136.5	132.2
	DBP (mm/Hg)	82.8	79.7
	HDL (mg/dL)	45.3	50.4
	LDL (mg/dL)	119.7	109.1

		Riverside dwellers		Urban	
Gomes *et al.,* 2021		Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
	PAS	160	140	153	140
	PAD	80	80	92	85

		Control group		Intervention group	
		Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Firmino *et al.,* 2022	HbA1c (%)	-	-	8.1	7.2
	Fasting blood glucose (mg/dL)	118.5	116.8	151.8	121.4
	SBP (mm/Hg)	138.4	137.6	139.4	128.3
	DBP (mm/Hg)	79.2	82.9	82.4	77.7
	Cholesterol (mg/dL)	196	185.6	202.9	193.9

TG (mg/dL)	153.7	161.7	184.9	171.4

Source: Prepared by the author (2024).

The systematic review carried out by Melo *et al.* (2021) shows that interventions pharmaceutical companies bring benefits to improving the patient's quality of life by increasing adherence to treatment, provide information and manage DRPs. In PHC, AFT provides more individualized care, ensuring that medications are used in a correct and safe (Repolho, 2021; Schütz, 2022).

The inclusion of the pharmaceutical professional in the healthcare team is essential and results in better clinical outcomes, greater quality of life for patients and optimization of health resources (Melo *et al.,* 2021).

FINAL CONSIDERATIONS

When carrying out the bibliographic survey to formulate the portfolio of articles, it was found that the number of researches directed at pharmaceutical evaluation in PHC is still small compared to the number of studies on this service in a hospital setting. This is illustrated by the number of studies excluded from this review because they were not related to this theme and not be carried out in this practical scenario.

The correct definition of the terms “APS” and “pharmaceutical care” was one of the great challenges faced in carrying out this study, since numerous authors use them in different senses.

The evidence gathered in this review study suggests that pharmaceutical care contributes significantly to improving patients' health laboratory results who go through the AFT process and health education.

Furthermore, it is possible to conclude that pharmaceutical care does not necessarily need be limited to the walls of primary care units/UBSs, and can also be provided with quality in community pharmacies, homes and clinics.

The positive evolution of health conditions depends on the agreement and formation of link between pharmacist and patient to work synergistically towards the clinical objective. The emergence of positive results also depends on the team's reception multidisciplinary approach to the pharmacist and their suggestions for interventions.

Furthermore, it appears that laboratory tests are good tools for providing of results that allow measuring in values the impacts that the service of a team health promotes diseases such as DM, hypertension and dyslipidemia.

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