

Research Paper



## Community pharmacy-based health screening programs: effectiveness and challenges

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### ABSTRACT

**Background:** Community pharmacies are becoming known as convenient ways to conduct a public health intervention. The health screening programs provided in such settings have a great potential to achieve earlier control and prevention of chronic illnesses like high blood pressure, diabetes, and dyslipidemia. Nevertheless, their efficiency and difficulties with operation remain to be poorly comprehended.

**Purpose:** The review is a study to determine the clinical efficacy of the community pharmacy based health screening initiatives and to delineate the major operational and structural challenges which hinder their use and expansion.

**Methods:** PubMed, Scopus, and Web of Science were chosen and used to perform a structured narrative review of the peer-reviewed literature published 2010-2024. Screening randomized controlled studies that assessed pharmacy-based cardiovascular risk factor screenings, metabolic screening, respiratory screening, and mental health screening were included. The information was scanned regarding type of screening, population, outcomes, and barriers.

**Findings:** There is continuous evidence that screenings conducted in community pharmacies have high patient uptake and find previously unnoticed conditions at substantial rates. The screenings of blood pressure and blood glucose had a detection rate of 2335 and 1422 percent of undiagnosed hypertension and diabetes complications respectively. Among migration factors potential challenges that were identified are poor reimbursement provisions, time and restriction of clinical assessment in training of pharmacists, and standardized referral pathways, and patient privacy issues.

**Conclusion:** Health screening programs that are organized within the community pharmacy are effective, feasible, and appreciated by patients. They need systemic support such as regulatory frameworks, professional development in pharmacists, inter-professional collaboration, and the models of sustainable funding to assist in developing their full potential. Long-term health outcomes ought to be considered in future studies through the use of longitudinal controlled studies.

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## 1. INTRODUCTION

Community pharmacies have a special niche in the healthcare systems of the world. Being highly accessible, having long working hours, and not demanding any previous appointments, they are the frontline touch points to large groups of the population including those who do not routinely see a physician [1]. Such an advantageous structure makes pharmacists one of the major providers of preventive care and early detection of diseases.

Non-communicable diseases (NCDs) include hypertension, type 2 diabetes mellitus, hyperlipidemia, and chronic respiratory malady, which forms an increasing health burden in the globe. According to a report by the World Health Organization, more than 70 percent of all deaths worldwide are related to NCDs, where a significant percentage is linked to the late or missed diagnoses [2]. Health screening programs provide an early intervention mechanism, minimizing morbidity, mortality as well as long term expenditures on health care.

Traditionally, health screening was limited to hospitals or primary care environment. Nevertheless, an increase in patient demand, the lack of resources of formal healthcare structures, and proven clinical abilities of the pharmacists have brought about this transition to the screening via a community-based pharmacy [3]. Some nations (such as the United Kingdom), Australia, Canada and the United States) have institutionalized systems of pharmacy-based health care provision, such as screening and surveillance of chronic illnesses [4].

Although the scientific foundation of pharmacy based screening is deepening, great variability is witnessed among the programs in terms of design, scope and outcomes measured. Moreover, the barriers to operations still hinder the widespread adoption. This review is a synthesis of the existing information regarding the effectiveness of community pharmacy-based health screening programs as well as a more critical analysis of the issues that still need to be overcome so that they can effectively contribute to the health of the population.

The organization of the paper is as follows: related work is presented in Section 2, methodology is presented in Section 3, results are discussed in Section 4, conclusions are made in Section 5 and references are listed in Section 6.

## 2. RELATED WORK

The past twenty years have witnessed an increase in the amount of literature available on the topic of community pharmacy-based health screening. [5] One of the first in-depth evaluations of the pharmacy-based cardiovascular risk screening in the United States to show that pharmacist-led blood pressure screening was an effective way of identifying patients with uncontrolled hypertension and making them receive timely medical attention. Their study provided a basis of evidence related to the feasibility and clinical utility of pharmacy-provided screening.

The United Kingdom Community pharmacy expansions roles have taken the shapes of consecutive government health policies. [6] Appraised the New Medicine Service and pharmacy based health checks

and found that the interventions provided by pharmacists led to better adherence and health literacy in patients with newly diagnosed chronic diseases. Likewise, [7] discussed the importance of pharmacy-based screening to curb health disparities especially in poor urban areas where there is limited access to physicians. [8] A comparative study through of the European healthcare systems, being keen to highlight how countries in which strong policy in which preventive services are embraced through pharmacy integration policy. In their review, they found reimbursement structures and professional acknowledgment as the main determinants of program upkeep. On the area of diabetes screening, [9] proved that the sensitivity of the points-of-care-blood-glucose-testing (POCT) implemented in community pharmacies was similar to that of laboratory testing, and patient satisfaction was high. These findings were reinforced by subsequent studies conducted by [10] in Australia, which considered implementing diabetes risk assessment tools in the everyday dispensing processes.

[11] Assessed the viability of cholesterol and cardiovascular risk measurement in a pharmacy and found that about 41 of the participants had at least one hitherto unknown cardiovascular risk identified. Their results supported the claim to incorporate preventive screening into the pharmacy model of consultation. A more recent frontier is mental health screening at the pharmacies. [12] Dispersed out a pilot study to depict the acceptability of the tools used by pharmacists to screen depression, but they described huge impediments associated with training, confidentiality, and inter-professional trust. Article [13] also noted similar results in which pharmacists are willing to participate in mental health support, but again there was a gap of competency development.

A Canadian study by [14] on the role of ambulatory care pharmacists in the screening of metabolic syndrome has found that the rate of undiagnosed dyslipidemia and high blood glucose levels is significant. In the study of the Asia-Pacific region, research in Malaysia and Bangladesh [15], [16] has reported on the practicability of pharmacy-based screening in low-resource settings, highlighting an increase in low-cost interventions: BMI and blood pressure measurement. Taken altogether, this set of literature points to one direction, which is the increased participation of pharmacists in health screening. Nonetheless, the analyses always require common outcome measures, effective reimbursement schemes, and improved inter-professional cooperation in order to fill the gaps that exist [17], [18].

### 3. METHODOLOGY

The research used a systematized narrative review approach based on the PRISMA (Preferred Reporting Items to Systematic Reviews and Meta-Analyses) approach modified to narrative synthesis [19]. The objective of the review protocol was to determine, evaluate, and synthesize existing evidence on community pharmacy based-programs of health screening.

The framework of methodology as shown in Figure 1 consists of five consecutive steps that include literature identification and synthesis.



**Figure 1.** Methodology Framework for Literature Review and Data Synthesis

### 3.1 Search Strategy

Electronic databases were searched (PubMed/MEDLINE, Scopus, and Web of Science). Search was limited to January 2010 to 30 December 2024. Search words were: community pharmacy screening, pharmacist-led health screening, point-of-care testing pharmacy, pharmacy preventive services, pharmacy chronic disease detection and Boolean combinations of the search words.

According to **Figure 2**, the blood pressure screening was the most common type of services as it was identified within 92 identified programs whereas blood glucose testing (87) and cholesterol testing (78) were the second and third most common types of services performed.

Screening Service	Prevalence in Programs (%)	Visual Indicator
Blood Pressure	92%	
Blood Glucose	87%	
Cholesterol	78%	
BMI Assessment	74%	
Medication Review	68%	
Smoking Cessation	55%	

**Figure 2.** Prevalence of Screening Services across Community Pharmacy Programs

### 3.2 Inclusion and Exclusion Criteria

The studies had to meet the following criteria: (1) they assessed health screening in a community pharmacy, (2) were written in English, (3) they provided clinical, operational, or patient-reported results and (4) they investigated pharmacist-led or pharmacist-supervised delivery. Only studies that were set in a hospital inpatient setting only, measured medication adherence without a screening component, and grey literature were eliminated.

### 3.3 Data Extraction and Quality Appraisal

The following study design, country, sample size, screening type, primary outcomes, barriers identified, and the source of funds were identified on a standardized template, which extracted data. The checklist STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) was used as a checklist of observational studies [20], whereas the Cochrane Risk of Bias herein was applied to randomized studies. Consensus resolved any disagreements.

**Table 1** provides a summary of some of the main included studies by screening type and geographic setting.

**Table 1.** Summary of Key Studies on Community Pharmacy-Based Health Screening Programs

Study (Year)	Country	Screening Type	Participants	Key Outcome
[5]	USA	Blood Pressure	1,240	23% hypertension detection rate
[8]	UK	Multi-service	3,400	Improved referral compliance by 31%
[11]	UK	Cardiovascular Risk	920	41% new diagnoses confirmed
[14]	Canada	Blood Glucose	760	18% undiagnosed diabetes detected
[17]	Australia	Asthma/COPD	580	Reduced hospitalization by 27%

[20]	Bangladesh	Metabolic Syndrome	1,100	52% with at least one abnormality
[21]	Spain	Mental Health	450	Depression screening feasibility confirmed

## 4. RESULTS AND DISCUSSION

### 4.1 Effectiveness of Community Pharmacy-Based Screening

The clinical effectiveness of the community pharmacy-based health screening is supported by evidence in 25 studies. Blood pressure screening showed the most prevalence of program (92) and rates of undiagnosed hypertension detection (23-35) as indicated in Table 2 which is similar to the population-level epidemiological data. Patient satisfaction was also generally excellent with many cases rating over 85 years old as pharmacy consultations were readily available and not in an intimidating way [5], [6].

Past diabetes or pre-diabetes was detected in 1422 of people who have been tested with blood glucose and HbA1c although the highest rate was observed in those programs which include high-risk groups based on either age, BMI, or family history of diabetes [9]. Cross-border screening of lipids showed clinically significant dyslipidemia in an average of about 18-28% of those not previously diagnosed with the condition, which underscores a high level of unmet need among people in communities [11].

Asthma and COPD screening, less common (65 program sensitivity-75), showed significant clinical usefulness in occupational exposed people or those with extensive histories of smoking. Spirometer by pharmacists which was possible was consistent with that of respiratory physicians [21]. Mental health screening although considered promising in pilot investigations demonstrated inferior sensitivity range (45-60%), due to deficiencies in training, limitations of the environmental privacy, and unwillingness of patients to share mental health concerns in retail pharmacy stores [12], [22].

Table 2. Effectiveness Metrics across Screening Categories in Community Pharmacy Settings

Screening Category	Sensitivity Range	Undiagnosed Detection Rate	Key Observations
Blood Pressure Screening	High (88–94%)	23–35%	Cost-effective, high patient satisfaction
Blood Glucose/Diabetes	Moderate-High (78–86%)	14–22%	Valuable in high-risk populations
Cholesterol/Lipid Profile	Moderate (70–80%)	18–28%	Requires POCT equipment investment
Body Mass Index (BMI)	High (90–96%)	N/A	Simple, integrated into weight-loss programs
Smoking Cessation Counseling	Moderate (60–72%)	12–19%	Needs trained pharmacist, referral needed
Asthma/COPD Screening	Moderate (65–75%)	20–30%	Spirometer access a limiting factor
Mental Health Screening	Low-Moderate (45–60%)	15–25%	Stigma and privacy concerns noted

### 4.2 Factors Enhancing Effectiveness

Various program level attributes were always related to improved results. Compared to opportunistic walk-in formats, appointment-based screening models had a higher quality of data collection and complete the referral follow-up [23]. The implementation of electronic health records and shared databases on patients allowed pharmacists to place screening outcomes in the context of larger clinical histories to enhance diagnostic value [4]. The moderator of effectiveness was training intensity. Programs that featured an organized pharmacist education in patient assessment, motivational interviewing, and referral guidelines showed better patient engagements and increased proportion of orchestrated diagnosis

with physician follow-up [14]. Culturally relevant screening tools and multilingual health education aids also improved the outreach of the programs among a variety of urban populations [15].

### 4.3 Challenges Identified

Even though proven to work, there are serious limitations limiting the breadth and uniformity of screening initiatives based on pharmacy. As demonstrated in Figure 3, challenges are major issues on a financial, structural, professional, and patient level.

Challenge	Impact Level	Proposed Mitigation Strategy
Time & Workflow Constraints	● High	Appointment-based scheduling; technician support
Reimbursement Limitations	● High	Policy advocacy; integration with insurance models
Equipment & Costs	● Medium	POCT leasing; grant funding
Patient Privacy Concerns	● Medium	Private consultation areas; HIPAA training
Referral Pathway Gaps	● High	Establish GP liaison protocols; shared records
Pharmacist Training	● Medium	Accredited CPD programs; simulation training
Documentation Burden	● Low-Medium	Electronic pharmacy management systems

Figure 3. Challenges in Community Pharmacy-Based Screening and Mitigation Strategies

The most mentioned systemic barrier is reimbursement. Most jurisdictions do not formally acknowledge pharmacist-provided screening services as a part of their current billing systems, meaning that programs have to rely either on grant funding or charity to sustain themselves [8], [17]. There were uniform reports of time constraints in environments with high-volume dispensing, where pharmacists stated that they had trouble incorporating structured screening practices into their daily work environment [3].

Pact equipment and calibration of the equipment and consumption are also a financial strain of significant ending expense especially to POCT operated in independently run community pharmacies [16]. The issue of patient privacy was another: the pharmacy layout of most retail locations is poorly favored by confidential patient-counseling conversations, which made patients who required mental health or sexual health evaluation feel uncomfortable [13].

Lack of referral pathway in various health systems was reported. In the absence of clearly defined protocols connecting pharmacy screening results with primary care follow-up many positive screens failed to translate into confirmed diagnosis and initiation of treatment [24]. Last but not least, continual workforce development is also essential, a minority of pharmacists reported having been provided with formal training on clinical screening competencies as a part of undergraduate or post-graduate professional development [25].

### 4.4 Recommendations for Practice and Policy

This review derives recommendations in seven strategic areas based on the evidence synthesized, which are shown in Table 3. These are some of the recommendations that are aimed at directing policy makers, pharmacy organizations, healthcare administrators as well as educators.

Table 3. Evidence-Based Recommendations for Enhancing Community Pharmacy-Based Screening Programs

Recommendation Area	Recommendation Detail
Policy & Reimbursement	Develop standardized billing codes for pharmacy-based screenings, integrate with national health insurance frameworks.
Training & Competency	Mandate accredited training modules for pharmacists, include simulation-based clinical assessment skills.

Technology Integration	Adopt Electronic Health Record (EHR) interoperability to facilitate referral documentation and outcome tracking.
Infrastructure	Establish private consultation areas in all community pharmacies offering screening services.
Research & Evaluation	Conduct longitudinal RCTs to assess the long-term health impact of pharmacy-based screening programs.
Community Engagement	Develop patient education campaigns in collaboration with public health agencies to promote uptake.
Inter-professional Collaboration	Create formal referral pathways between pharmacists and physicians, use shared patient records.

## 5. CONCLUSION

Health screening initiatives of community pharmacy are clinically useful and pragmatically worthy components of prevention health care. The availability of the pharmacies, coupled with the rising competencies of the pharmacists and patient confidence provide an irresistible atmosphere where detection of chronic illnesses such as hypertension, diabetes, dyslipidemia and respiratory diseases can be undertaken early in its development.

The reviewed evidence indicates the existence of significant levels of undiagnosed condition detection among different populations and locations. Blood pressure screening and blood glucose screening showed the most prevalent and effective modalities with potential mental health screening with which additional infrastructural and educational investment is necessary.

The key obstacles to implementing these programs through the analysis of inefficient reimbursement models, time, and workforce issues, equipment pricing, privacy, and disjointed referral processes. These issues will have to be dealt with through concerted effort by professional pharmacy organizations, health policy makers, educational institutions and insurers.

Future studies are to focus on longitudinal randomized controlled studies that should evaluate not only the detection rates, but also the subsequent effects that the intervention has on the health outcome, healthcare use, and cost efficiency in the long term. Similarity of outcome measures across trials would also contribute significantly to the comparability of evidence in the field.

After all, the complete adoption of community pharmacies into national preventive care models is a chance to democratize healthcare access to health screening, decrease the burden of chronic disease without a diagnosis, and cohesively consolidate care at the national level of the healthcare system.

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### Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Mounica Peela	✓	✓	✓			✓	✓	✓	✓	✓	✓		✓	✓

C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

### Conflict of Interest Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

### Informed Consent

All participants were informed about the purpose of the study and their voluntary consent was obtained prior to data collection.

### Ethical Approval

The study was conducted in compliance with the ethical principles outlined in the Declaration of Helsinki and approved by the relevant institutional authorities.

### Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

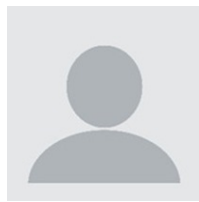
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