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# A systematic review of involvement and practice of community pharmacy professionals in child health services

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**ABSTRACT**

Community Pharmacists (CPs) play a crucial role in delivering Child Health Services (CHS); the extent of their participation, practices, and the challenges and facilitators to providing these amenities remain largely unexamined. This study aims to consolidate existing research regarding the involvement and role of CPs in maternal and CHS. Seven online databases were queried for articles published in English from the records' creation. Studies were selected based on the evaluation of the participation and procedures of CPs in mothers and CHS. All full papers selected for the final analysis were assessed for quality utilizing the Mixed Method Assessment Tool (MMAT), with data extraction performed and verified. A total of 2900 articles were identified. After evaluating the inclusion standards, 14 full-text papers were selected for the final study. Eight research investigations indicated that CPs participated in maternal wellness programs by offering breastfeeding direction, counseling on the advantages of vitamins throughout pregnancy, providing immediate contraception suggestions, and addressing signs of disease such as backache. Three research investigations examined CPs offering guidance on managing acute diarrhea in children. Three investigations additionally provided information on prescription drug counseling and medications for children. CPs identified the perceived opinions of customers, issues with health insurance, time constraints, and inadequate rewards for treatments rendered as the primary obstacles to service delivery. CPs participated in many maternal and CHS within CP environments. The implementation of practices did not align with the combined Federation of International Pharmacy (FIP)/World Health Organization (WHO) recommendations on optimal pharmacy procedures for certain services, including managing symptoms of diarrhea.

***Keywords:*** *Community pharmacy, Child, Health, Review.*

## 1. INTRODUCTION

Community Pharmacy (CP) constitutes a sector of general medicine that caters to a significant segment of the European populace [1] [16]. Around 500k CPs in Europe were used by 48 million persons daily, accounting for nearly 12% of the 620 million individuals residing in the European Union (EU). The fundamental pharmacy services throughout the EU encompass the delivery of medications, managing medications, emergency care (such as emergency contraceptives), and the therapy of minor ailments [2] [8]. In Slovakia, up to 72% of hospitalizations were attributed to the unavailability of alternative medical options. In the United Kingdom (UK), the National Health Service (NHS) indicated that 19 million General Practitioners (GP) rendezvous and 2.2 million Emergency Department (ED) trips could have been managed by a CP, potentially saving the medical system £870 million in 2020 alone [9] [17]. The pediatric demographic has notably impacted the escalation in emergency department visits, with the UK experiencing a 27% increase in participation. A significant portion of this was ascribed to the inadequacy of other primary care providers in addressing children with mild ailments. CPs have the chance to reframe their role in managing pediatric illnesses. They can serve as the initial point of contact for diseases and reduce the strain of managing non-severe pediatric cases in other overwhelmed primary care settings.

To attain the UN's Sustainable Development Goal (SDG) of decreasing mother and child mortality, worldwide access to health care must be enhanced [3] [18]. Many patients utilize healthcare facilities as the initial access point for various Child Health Services (CHS) [12] [13]. The absence of available community-oriented medical centers and insufficient training among healthcare professionals pose significant barriers to providing healthcare for mothers and children, particularly in resource-constrained environments [4] [19].

Access to pediatric medical care is crucial for reducing child mortality rates and meeting SDG targets. The considerable deficit of proficient healthcare practitioners presents obstacles and disparities in access to fundamental CHS in low-income

nations [6]. The WHO advocates for incorporating diverse medical professionals into the central medical system, particularly in developing countries, to address the deficit of qualified practitioners and enhance access to health insurance for all [10]. Strengthening the functions of CP specialists in many public health contexts, particularly in CHS, could augment service accessibility and reduce expenses related to hospital visits [5][14].

Task shifting is seen as a crucial method to expand the professional practice of medical professionals in resource-constrained environments. Transferring responsibilities such as contraception counseling, addressing minor illness indicators, and administering immunizations to CPs will enable midwives, Obstetricians, and other experts to focus on delivering higher-level treatment requiring specialized skills and expertise [11]. In resource-constrained environments, reallocating responsibilities to CPs helps address service provision deficiencies, as they are conveniently situated inside the community.

The International Pharmacy Federation (FIP) cabinet endorsed a policy statement advocating for the expanded involvement of CPs to enhance maternity, neonatal, and CHS [7]. The statement of principles is grounded in the professional duties of CPs. It aims to support the SDG by mitigating the mortality of mothers and babies, particularly by enhancing access to essential medical services for these vulnerable populations. According to FIP guidelines, data suggests that despite variations in the degree of involvement and performance among CPs, CP-led services effectively enhance favorable maternal and CHS [15]. Despite proof of efficacy, there is a dearth of studies examining the extent of participation and the barriers and obstacles affecting CPs' capacity to participate in maternal and CHS within their professional scope. This research aimed to consolidate current research regarding the participation and role of CPs in maternal and CHS.

## 2. MATERIALS AND METHODS

The researchers, aided by the librarian, established suitable search variables and pinpointed the most pertinent libraries for the review. A comprehensive exploratory investigation was conducted, and the literature was meticulously evaluated and synthesized to draw findings and contemplate future actions.

Online databases were meticulously examined, employing multiple combinations of the terms. The libraries were queried using Boolean logic and truncation markings to produce a thorough collection of literature. The preliminary literature was evaluated against precise inclusion and exclusion conditions to uncover results aligned with the study's aims. After acquiring articles via database searches, the citations of these papers were further examined to confirm that no pertinent material was overlooked in the libraries. A few relevant articles were discovered using this strategy alongside those using libraries. Figure 1 presents a comprehensive overview of the research screening and selection process for synthesizing in a narrative review, illustrated by a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram. All studies incorporated in the analysis were separately and together assessed for publication error and limited reporting.

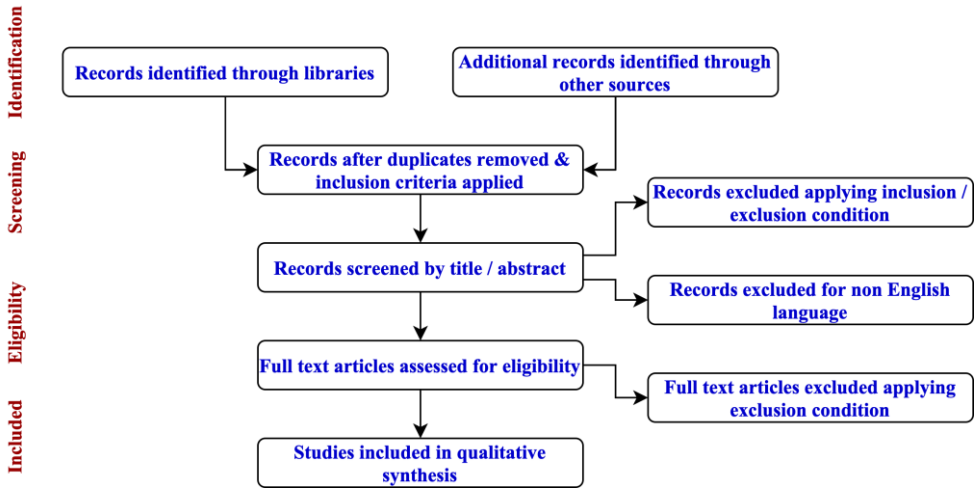



**Figure 1: Workflow of the study**

### *2.1 Criteria for selection*

#### *2.1.1 Inclusion standards*

- The primary result must pertain to CPs' maternal or CHS.
- Only leading publications are considered; research protocols, reviews, and expert opinions are omitted.
- Articles released in English with full-text access
- The papers published in peer-reviewed publications
- Investigations included without methodological restrictions (both subjective and quantitative)

#### *2.1.2 Criteria for Exclusion*

- Student-directed maternity and CHS
- Should the significant emphasis not be on maternity or CHS
- Not subjected to peer assessment
- Not published in the English language
- Targeted healthcare experts, excluding CPs
- Excluded publications include study protocols, reviews, and expert opinions.

### *2.2 Evaluation of methodological rigor*

The research evaluated the quality of all papers reviewed. The quality of the listed studies was assessed utilizing the Mixed Methodology Assessment Tool (MMAT). The instrument has two screening questions and five criteria for each study design. The papers were initially evaluated based on the first two screening inquiries. Articles that met the selection criteria were assessed for their general efficacy. A single star is conferred for each condition. Articles receiving a 'YES' reaction for all five inquiries were designated five stars.

### *2.3 Data extraction*

Data was retrieved from the publications included in the analysis utilizing a standardized data extraction approach. The information extraction style comprised the first author's name, publishing year, title, environments, study goals, layout, data gathering techniques, and principal findings. The research gathered data from the included study.

### *2.4 Data summary and evaluation*

Following data extraction, a thematic approach and narrative summary were employed to evaluate and combine the amount of participation, extent of execution, types of services supplied, and barriers and instructors, contingent upon the content of the publications.

## 3. STUDY ANALYSIS

The findings are categorized by theme.

### *3.1 Perspectives*

#### *3.1.1 Parental Perceptions*

Parents frequently compare CPs to alternative sources of prescription advice. A UK study revealed that 85% of parents consider guidance on managing minor illnesses in children to be 'useful' in addressing the issue. Another indicated that 81% of parents said they got 'extremely helpful' or 'helpful' guidance from CPs concerning non-prescription drugs. In comparison, 87% of the advice provided was comprehended by families.

There remain fluctuating degrees of public confidence in CPs. Parents prioritize medical data from the Internet and general practitioners over that provided by CPs. Research conducted in Finland revealed that merely 45% of parents consulted pharmacies for advice on managing their ailing children, in contrast to 72% who sought guidance from doctors. Families preferred obtaining written advice from a physician or doctor (52%) or verbal advice from a pharmacy (31%) when consulting health care experts.

Parents cited multiple reasons for their lack of faith in the advice provided by CPs. In Greece, families were reluctant to engage CPs due to the indifferent approach to selling medicines without prescriptions, perhaps resulting in widespread resistance and adverse outcomes. A distinct study in the Netherlands revealed that parents lacked confidence in CPs' statements regarding dosages and medicine administration, preferring to rely on their limited understanding. UK parents perceived that CPs possessed insufficient expertise regarding their children.

The pharmacy's environment can significantly influence customers' opinions. Parents perceived the presence of substance users congregating at drugstores while expecting harm reduction assistance and guidance as profoundly intimidating for both parents and their kids. This corroborated the findings of a study conducted in the UK, which revealed that caregivers of small children perceived CPs as lacking the confidentiality seen in other primary care settings.

#### *3.1.2 Adolescents*

Young people throughout Europe possess distinct perspectives toward CPs. A 2020 study, which included over 5k teens, revealed that this demographic places greater trust in CPs than in any other age category. A UK experiment of pharmacy-based oral contraceptive supply substantiated this concept. After the experiment, an impressive 91% of adolescent girls indicated they were 'extremely familiar' or 'comfortable' talking contraceptives with CPs, while 86.2% expressed satisfaction with the service provided. Due to the established rapport CPs typically have with clients through repeated interactions, they contend that their responsibilities should be broadened to include the administration of vaccines against HPV and the provision of oral contraceptive pills to adolescent females.

### *3.2 Prospective Opportunities*

The literature indicated numerous possibilities for CPs to engage with patients in diverse roles.

#### *3.2.1 Acute Minor Illness*

The literature indicates a potential expansion of CPs' roles in managing severely ill youngsters. A UK study indicated that 8% of emergency department attendance was suitable for therapy by CPs instead. Likewise, 14% of consultations involving children in UK routine care were classified as unnecessary, compared to only 8% for adults. These investigations indicate a potential for redirecting children from alternative primary care options to CP.

#### *3.2.2 Persistent Illness*

Numerous studies emphasized the significant role CPs assume in treating chronic pediatric conditions. A study tested CP treatment in childhood eczema, leading to a substantial decrease in the severity of all complaints. Additionally, 75% of parents deemed the provided information 'extremely useful' or 'helpful,' resulting in a significant enhancement in utilizing effective emollients. A comparable CP-led strategy was tested in Spain to enhance the management of childhood asthma. The treatment resulted in a 0.82-point enhancement in quality of life metrics and a notable 1.24-point decrease in poorly managed asthma relative to the control condition. In the management of type 1 diabetes in kids, those in the CPs-led treatment group exhibited little change in their levels when compared with the control group. Researchers indicated this was attributable to inadequate follow-up participation within the treatment group.

For CPs to significantly influence the treatment of chronic illnesses, they must cultivate more intimate connections with teenagers. The presence of children during medicine collection would enable CPs to facilitate their comfort with the data conveyed and the environment. Additional literature concurs that the consistent presence of children for medication collection enhances adherence. The integration of counseling for kids and the dissemination of pertinent pamphlets mitigate the incidence of non-adherence to medications within this demographic. Adolescents can be advised on the combination of pharmaceuticals with drinks or other drugs, as this pertains to their lifestyles and fosters a connection with a 'non-judgmental' pharmacy.

Enhancing communication among hospitals, CP, and medical professionals is essential for effectively managing chronic illnesses in children and improving the continuity of treatment for children and their parents. This is primarily due to insufficient data exchange among these three care interfaces about pediatric medicine. To maintain parental commitment and alleviate frustration over the care of their ill kid, enhanced coherence among services is essential.

#### *3.2.3 Gestation and Prenatal Care*

A research project in the Netherlands established a novel CPs-led service to enhance understanding of folic acid utilization throughout pregnancy for women attempting to conceive. After the program, the incidence nearly decreased by fifty percent within a year, and 92% of the population endorsed the project.

#### *3.2.4 Drug Safety Monitoring*

The literature recognized the potential role of CPs in improving pharmacovigilance. The prevalence of epilepsy in individuals under 20 is roughly 0.7%, but the rate of Attention-Deficit/Hyperactivity Disorder (ADHD) in school-aged children is over 6%. The treatment of these disorders necessitates medicine with a significant incidence of side events, hence requiring careful monitoring, particularly in young kids. Two studies in Scotland advocated increased CP participation in the UK Yellow Card system (YCS) for adverse reactions to guarantee accurate documentation of drug side effect profiles. Should the acceptance among CPs improve significantly, it might serve as a vital resource for adverse drug reaction reports, given that CPs often serve as the initial point of contact for medication-related concerns.

CPs should enhance their contribution to pharmacovigilance by increasing the frequency of Medication Use Reports (MURs) on medicines for chronic diseases. An English research revealed that the participation rate of CPs in MURs was as low as 25.2% while assessing the experiences of young kids on medicine for chronic diseases. A related UK trial study underscored the significance of the findings, revealing a seven-point gain in median controlling asthma when CPs frequently provided MURs and asthma counseling. The rise in MURs would require enhanced compensation and more training to ensure CPs are proficient in conducting such inspections.

#### *3.2.5 Utilization of Medications*

There exists a disparity in the utilization of medications throughout Europe. Nearly 55% of Finnish children engage in over-the-counter self-medication, particularly for the management of asthma and high temperatures. An Italian study including over 1.8 million children and adolescents indicated that over 98% of youngsters received at least one medication prescription monthly. Germany had a reduced incidence of over-the-counter drug consumption, with merely 34.3% of 16-year-olds having utilized them in the preceding month. It was discovered that 32% of all medications acquired by minors in Germany, particularly sedatives, were used without a doctor's prescription. The utilization of drugs among German children was linked to several characteristics, including elevated schooling for mothers, higher incomes for families, non-immigrant status, and

the presence of chronic illnesses in children. In the UK, it was discovered that 25 million instances of cough medication were administered to children, despite a Cochrane review revealing insufficient data about the efficacy of these treatments.

The 62 fatalities linked to cough medications were associated with unintentional contact (21%), deliberate overdose (7%), and medication mistakes (17%), while the nature of overdose remained indeterminate in the remainder of 58% of instances. Kids are not being informed about the dangers of excessive use of over-the-counter medication, as a Swedish study reveals that teenage opinions regarding drugs are 'reckless and casual.'

#### *3.2.6 Utilization of Pharmaceuticals Beyond Approved Indications*

Research has provided insight into CPs' utilization of off-label medications, with UK research indicating that 42% of CPs provided pharmaceuticals in this manner. CPs exhibited the most significant awareness (85%) among healthcare providers concerning off-label recommendations, with most advocating for immediate clinical trials to rectify pediatric formulations. They are amenable to exercising flexibility in prescribing for kids, although a majority (65%) believe they must inform parents about possible problems associated with off-label prescriptions.

### *3.3 Additional Training Requirements*

The research examined the existing practices of CPs, proposing potential enhancements to upholding care requirements for children and adolescents.

#### *3.3.1 Crisis Environment*

Learning specific to diseases or treatments for CPs has demonstrated efficacy. A notable instance occurred in a study examining CPs' perceptions of anaphylaxis. Seventy-seven percent of CPs were knowledgeable about applying adrenaline auto-injectors as the primary treatment for pediatric food allergy anaphylaxis; however, only seven percent expressed confidence in operating the device. This indicates that additional training in critical circumstances might enhance the knowledge base of CPs.

#### *3.3.2 CPs as Pharmaceutical Consultants*

The literature indicated that CPs were reluctant to utilize corticosteroids to treat chronic asthma in children. Owing to their convictions and their role as trusted drug advisors, they discouraged parents from using steroids in asthma control, resulting in what one research termed a countrywide 'corticosteroid fear' in France. Enhanced training for CPs in asthma management, particularly about the proper use of corticosteroids, is essential to mitigate the undue emphasis on their 'dangerous' adverse reactions.

#### *3.3.3 Pharmacovigilance*

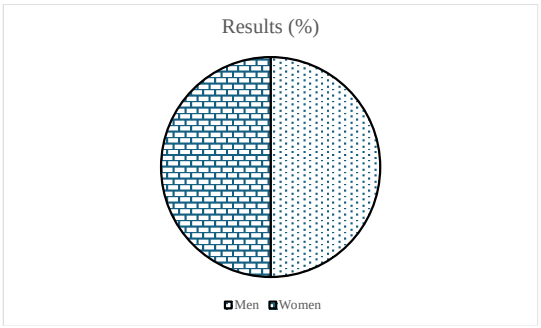
The literature study revealed a significant occurrence of dangers at CP. A survey of almost 4k security incidents in England and Wales indicated that pharmaceutical errors were significantly more prevalent in CP compared to traditional dentistry practices or CP. The research advocated for a barcoding method that might diminish the likelihood of mistakes from human entry and serve as an additional safety measure.

Aside from technical prescription issues, CPs can err in selecting medications for acutely ill children. A Swedish 'unknown shopper' research revealed that CPs dispensed incorrect medication to febrile kids in up to 7% of cases, while a French investigation found that CPs administered strictly contraindicated pharmaceuticals to children 14.5% of the time.

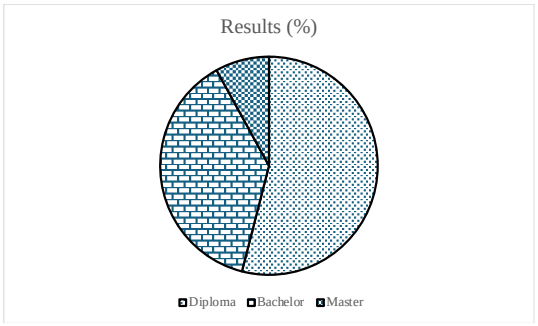
Dutch research contended that these inaccuracies could stem from CPs' minimal utilization (15%) of current literature, whereas a significant percentage (62%) exhibited a firm reliance on product monographs. The suboptimal selection of medicine is attributed to the CPs' history-taking practices in severely ill kids. Belgian research indicated that 81% of pharmacies failed to inquire about dehydration signs in an eight-month-old with acute diarrhea, whereas only 32% opted to prescribe an Oral Rehydration Solution (ORS). Some data indicates that CPs' expertise is inadequately implemented due to insufficient interrogation, ineffective communication abilities, and parental constraints. A potential answer is to enhance both the quantity and standard of training provided to CPs in conjunction with their regular practice.

## 4. RESULTS AND DISCUSSIONS

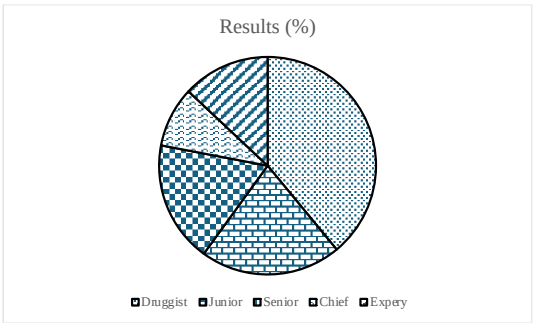
Out of 265 CP practitioners contacted, 235 participants finished the surveys, resulting in an answer rate of 85%. The attributes of the research's respondents are delineated in Figure 2.



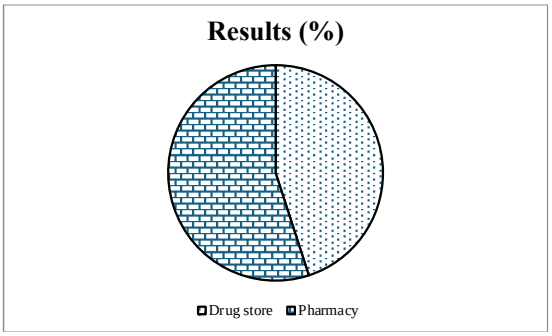

**(a). Gender analysis**




**(b). Education analysis**




**(c). Experience analysis**




**(d). CDRO analysis**

**Figure 2: Demographic analysis of the study**

### *4.1 Engagement of CP practitioners in the delivery of CHS*

CP practitioners exhibited the most significant average engagement score in 'encouraging vitamins' for children (mean = 4.1, SD = 0.52). The breakdown of percentages indicated that most CP practitioners reported being either 'extremely engaged' (41.2%) or 'involved' (45.7%) in 'encouraging vitamins for children. The second greatest mean engagement score among CP practitioners pertained to delivering CHS linked to advice on baby formulas, with 38% indicating 'extremely engaged' and 46.5% indicating 'present.' Most CP practitioners indicated their participation in CHS to manage mild symptoms, with over 52% reporting participation. The minimum mean participation score pertained to providing CHS associated with 'vaccination' (average = 2.42, SD = 0.78). A greater percentage of the respondents were 'somewhat engaged' (32.4%) and 'not engaged at all' (12.1%) in delivering immunization services relative to other CHS.

### *4.2 Variation in the engagement of CP in pediatric CHS*

A notable mean variation in participation in CHS was identified among several sub-groups of pharmacies. Notable disparities in mean participation were detected according to schooling in Pharmacy, degree of professional license, types of facilities, duties within the Coordination of Democratic Rights Organisations (CDROs), and stage of services training. A markedly more significant degree of engagement by pharmacy personnel in CHS was noted among those employed in 'pharmacy' environments relative to those in 'drug shop' environments. The participation of CP experts in CHS was markedly greater among CDRO 'owners than their 'employee' colleagues. A notable disparity in involvement was found regarding the 'in-service training position,' with diminished participation in CHS among individuals who did not report receiving training, contrasting with those who had undergone such training. The post-hoc analysis revealed significant variations in average engagement scores among sub-groups of research participants according to licensing levels. Participation ratings in CHS provision were higher among pharmacy practitioners with 'senior CPs' and 'skilled CPs' licenses than those with 'druggist trainee' licenses.

### *4.3 Dialogue*

This constitutes the inaugural comprehensive narrative examination of European neighborhood pharmacy utilization by kids, parents, and adolescents. Families and young individuals hold local CPs in high esteem, viewing them as credible sources of knowledge and guidance, especially for minor ailments, chronic disease administration, and medication assessments. Communication challenges with CHS providers and inpatient CP persist, necessitating ongoing quality enhancement to

provide prompt, uniform guidance and safe prescribing practices. Teenagers particularly appreciate the anonymity CPs offer for sexual wellness and vaccine guidance. This demographic's extensive utilization of goods and off-label medications raises concerns and highlights the need for enhanced health education and increased pharmacovigilance.

Although CPs are not typically seen as initial points for interaction, From a parental standpoint, enhanced training and certification can address the requirements of this age range, particularly when contrasted with medical professionals or the internet. Expanding the range of services provided in an appropriate physical setting would enable. The well-being of young kids and babies is significantly influenced by maternal health during pregnancy, and CPs can play a crucial role in identifying at-risk women and enhancing CHS.

This can be achieved by providing nutritional supplements during pregnancy, as demonstrated in the Netherlands, where the group receiving intervention observed a significant decrease in neural tube abnormalities. With suitable training and certification, CPs could provide a broader range of treatments, including enhanced access to cessation of smoking, weight, and substance reduction programs. These factors could significantly affect the mother's and CHS. The research anticipates reporting shortly on a pediatric-pharmacy collaborative training project presently being conducted in three regions of London, which serve as a valuable model for other nations.

### *4.4 Strengths and weaknesses*

The present review's strength lies in its extensive search method, encompassing numerous libraries and screening bibliographies from pertinent literature. Incorporating all study styles to synthesize the data at hand is an additional strength of the evaluation. Publication prejudice represents a limitation of this review, as pertinent research has not been approved or submitted for release, thereby eluding identification through the database queries. Only papers that appeared in the English language were selected. The absence of randomized controlled trials regarding the engagement and role of CPs in delivering mother and CHS constitutes a limitation. It represents a general constraint concerning the availability of proof rather than this specific study.

### *4.5 Consequences for policy, forthcoming practice, and studies*

The review indicates that CPs have provided various medical care services. As CPs are the most available health practitioners globally, various maternal and CHS could be enhanced by addressing the problems outlined in this review. Facilitating access to mothers and CHS through CP is essential for attaining full health coverage and the SDG of reducing maternity and child mortality, especially in developing nations. There is insufficient knowledge concerning the obstacles and enablers for CPs in delivering maternal and CHS; therefore, additional research is necessary to bridge this gap for execution purposes. To enable CPs to make a difference in maternal and CHS, it is essential to identify and analyze the hurdles to the accessibility of these facilities.

## 5. CONCLUSION

CPs have participated in delivering many maternal and CHS. CPs offered assistance, including counseling on medications during pregnancy, guidance on nutrients and folic acid, breastfeeding support, catastrophe contraceptive clause, acute diarrhea treatment for kids, MUR and therapy for kids, and vaccinations. Implementing practices did not align with the excellent pharmacy practice criteria in several healthcare settings, including managing diarrhea in kids. Insufficient time, consumer attitudes, absence of incentives, limited physician suggestions, and insurance policy issues were obstacles to delivering various maternal and CHS. Global entities such as FIP, WHO, and the national ministries of health in all nations should collaborate to optimize the expert contributions of pharmacies in delivering maternal and CHS within CP environments.

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