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# Journal of the American Pharmacists Association

## The community pharmacist as an independent prescriber: a scoping review

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<b>Abstract:</b>	<p>Background: Due to the shortage of professionals and the ever-increasing need for and demand for appointments, consultation with physicians is becoming increasingly difficult, and delays are increasing. To limit this issue, several countries have experimented with different models of independent prescribing through pharmacies.</p> <p>Aim: This study aimed to analyze the contribution of independent prescribing by community pharmacists in primary care using a micro, meso, and macrolevel framework.</p> <p>Method: This was a scoping review of three different databases: Medline, Scopus and Embase. The search (all databases) was executed on May 14, 2024. To be selected for the review, articles needed to be published after 2000, written in English or French, and focused on independent prescribing by community pharmacists. The articles had to investigate the pharmacist-independent prescribing (PIP) efficacy, effectiveness, or efficiency. Only original research was included. The bibliographies of the included papers were reviewed for additional studies. The articles were imported into Covidence to perform the review.</p> <p>Results: The search yielded 2802 articles, and 1062 remained after removing duplicates. Finally, 13 studies were included in the scoping review. As an independent prescriber, the community pharmacist can improve patient access to primary care, reducing treatment delays (microlevel). In addition, patient safety is maintained, and patients' quality of life is increased. Giving the community pharmacist an extra role helps reduce the workload on physicians, and thus facilitates access to care (mesolevel). The PIP model seems to be cost-effective for society and avoid medical consultations (macrolevel).</p> <p>Conclusion: This review highlights the potential value and relevance of pharmacist independent prescribers. Minor ailment services were frequently described, but PIP has also been implemented for chronic conditions. The benefits to society are felt at all levels: micro, meso, and macro. Its effectiveness and efficacy have been established, but additional studies are needed, particularly on its efficiency.</p>
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# The community pharmacist as an independent prescriber: a scoping review

Arthur Piraux, Dylan Bonnan, Aline Ramond-Roquin, Sébastien Faure

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## **Author contributions**

AP conceived the idea for the study, AP and DB developed the study protocol. AP conducted the literature searches and wrote the first draft of the manuscript. DB reviewed the manuscript for critical content. DB provided the visualization. ARR and SF supervised and reviewed the document.

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# The community pharmacist as an

## independent prescriber: a scoping review

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20 **Abstract**

21 **Background:** Due to the shortage of professionals and the ever-increasing need for  
22 and demand for appointments, consultation with physicians is becoming increasingly  
23 difficult, and delays are increasing. To limit this issue, several countries have  
24 experimented with different models of independent prescribing through pharmacies.

25 **Aim:** This study aimed to analyze the contribution of independent prescribing by  
26 community pharmacists in primary care using a micro, meso, and macrolevel  
27 framework.

28 **Method:** This was a scoping review of three different databases: Medline, Scopus and  
29 Embase. The search (all databases) was executed on May 14, 2024. To be selected  
30 for the review, articles needed to be published after 2000, written in English or French,  
31 and focused on independent prescribing by community pharmacists. The articles had  
32 to investigate the pharmacist-independent prescribing (PIP) efficacy, effectiveness, or  
33 efficiency. Only original research was included. The bibliographies of the included  
34 papers were reviewed for additional studies. The articles were imported into Covidence  
35 to perform the review.

36 **Results:** The search yielded 2802 articles, and 1062 remained after removing  
37 duplicates. Finally, 13 studies were included in the scoping review. As an independent  
38 prescriber, the community pharmacist can improve patient access to primary care,  
39 reducing treatment delays (microlevel). In addition, patient safety is maintained, and  
40 patients' quality of life is increased. Giving the community pharmacist an extra role  
41 helps reduce the workload on physicians, and thus facilitates access to care  
42 (mesolevel). The PIP model seems to be cost-effective for society and avoid medical  
43 consultations (macrolevel).



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**Conclusion:** This review highlights the potential value and relevance of pharmacist independent prescribers. Minor ailment services were frequently described, but PIP has also been implemented for chronic conditions. The benefits to society are felt at all levels: micro, meso, and macro. Its effectiveness and efficacy have been established, but additional studies are needed, particularly on its efficiency.

## 50 **Keywords**

51 Pharmacist, community pharmacy, independent prescribing, primary health care,  
52 health policy, pharmacy services, scoping review.

53

## 54 **Key points**

- 55 - PIP is often used for minor ailments but has also been implemented for chronic  
56 conditions.
- 57 - PIP improves care accessibility for patients and reduces treatment delays.
- 58 - PIP is seen as a useful service by general practitioners because it reduces the  
59 pressure on appointments.
- 60 - The pharmacist independent prescriber model is cost-effective for society.
- 61 - Additional studies are needed to evaluate PIP implantation in other settings.

62

## 63 **List of abbreviations**

- 64 - GP: general practitioner
- 65 - OTC: over the counter

66 - PIP: pharmacist independent prescribing

67 - QALY: quality-adjusted life year

68

## 69 **Background**

70 In many high-income countries, patient access to primary care is becoming more  
71 difficult. Due to the shortage of professionals and the ever-increasing needs and  
72 demands for appointments, physician consultation is becoming more difficult, and  
73 delays are increasing <sup>1-3</sup>. The prescribing of drugs by nonmedical health professionals,  
74 particularly pharmacists, is a newly implemented solution <sup>4</sup>. It emerged in the 1990s,  
75 initially in the United States, before spreading to Canada, the United Kingdom,  
76 Australia, and New Zealand at the beginning of the 21st century <sup>5-7</sup>. In most cases, this  
77 new pharmaceutical service started in hospitals or clinics before reaching the  
78 community.

79 Several models of pharmacist prescribing are offered, depending on the country, the  
80 pharmacist's level of training, or access to other health care providers. Some  
81 adjectives, such as "nonmedical prescribing", "additional prescribing", "collaborative  
82 prescribing", "supplementary prescribing", "emergency prescribing", or "independent  
83 prescribing", are used to clarify the pharmacist's capabilities and scope of practice <sup>8-</sup>  
84 <sup>12</sup>. These terms describe the range of authorized pharmacist prescribing practices and  
85 authorities, such as prescribing over-the-counter (OTC) medicines or prescription  
86 drugs, the necessity or not of a prior agreement from the physician to prescribe, or the  
87 possibility of continuing therapy. This study will focus only on the pharmacist  
88 independent prescribing (PIP) model, also named "autonomous prescribing", because  
89 it does not require any systematic agreements with prescribers <sup>11</sup>. PIP is generally

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90 proposed when a new diagnosis is not necessary (e.g., allergies, acne, contact  
91 dermatitis) but also for minor ailments (e.g., sore throat) or for prescription adaptation  
92 (e.g., dose, formulation, duration), substitution (e.g., equivalent medication in case of  
93 rupture), renewal (e.g., new prescription to continue the same treatment), or  
94 emergency prescriptions (urgent medical requirements, such as anaphylactic shock)  
95 <sup>13</sup>. Usually, only pharmacists specifically trained for this new service can prescribe  
96 independently. PIP is regulated and often based on national protocols <sup>14</sup>.

97 Some studies have shown that patients have high expectations and satisfaction with  
98 PIP services <sup>15-17</sup>. Other studies and reviews have examined pharmacists' abilities or  
99 barriers and facilitators to implement this new model <sup>18</sup>. Although PIP seems to be a  
100 lever to improve access to care, the impact of this service has not yet been well  
101 explored in terms of efficacy, effectiveness and efficiency. Efficacy can be defined as  
102 the ability to achieve the desired effect under controlled circumstances, effectiveness  
103 is about achieving the desired effect under ordinary circumstances (real life), and  
104 efficiency focuses on achieving objectives in the most economical way <sup>19</sup>. In other  
105 words, productive efficiency refers to maximizing the health outcome for a given cost  
106 or minimizing the cost for a given outcome <sup>20</sup>. This study aimed to analyze the  
107 contribution of independent prescribing by community pharmacists across their entire  
108 scope of practice for patients (microlevel), organizations (mesolevel) and society  
109 (macrolevel) in terms of efficacy, effectiveness and efficiency.

## 50 **Methods**

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111 Due to the lack of evidence in the literature on the benefits of PIP, a scoping review  
112 was conducted <sup>21</sup>. Moreover, scoping reviews are preferred for clarifying key concepts

113 and identifying research gaps for new topics <sup>22,23</sup>. The PRISMA extension for scoping  
114 review (PRISMA-ScR) guidelines were followed to conduct and report this study <sup>24</sup>.

## 115 **Search strategy**

116 To identify articles of interest, three bibliographic databases were chosen and  
117 explored, namely, Medline, Scopus and Embase, as they are generally considered  
118 major databases for biomedical research. To be selected for the review, articles  
119 needed to be published after 2000 (due to the recent implementation of independent  
120 pharmacist prescribing), written in English or French, and focused on independent  
121 prescribing by community pharmacists, regardless of the type of health problem  
122 addressed. The articles had to report the efficacy, effectiveness, or efficiency of PIP.  
123 All types of studies were accepted (quantitative, qualitative, and mixed-method  
124 studies). Papers were excluded if:

- 125 • They were not the subject of the original research;
- 126 • They focused on other types of pharmacists' prescribing (e.g., supplementary  
127 prescribing, collaborative prescribing, nonmedical prescribing);
- 128 • They took place in a noncommunity setting (hospital, emergency,  
129 interprofessional primary care clinics, care home);
- 130 • They analyzed the implementation process (barriers and facilitators to PIP  
131 implementation);
- 132 • They explored only the patients' experiences/satisfaction and their views about  
133 PIP, without any clinical results.

134 Papers mentioning specific measures regarding the COVID-19 pandemic, vaccination,  
135 contraception or naloxone were also rejected because this area was considered non-  
136 PIP specific. As these practices may be relatively well developed and documented in

137 the literature (e.g., contraception), this scoping review was intended to target new  
138 practices to demonstrate the scope of PIP.

139 The search (all databases) was carried out on May 14, 2024. The bibliographies of the  
140 included papers were reviewed to identify additional studies. The research strategy is  
141 available in Appendix 1.

142 The articles were imported into Covidence systematic review software to perform the  
143 review <sup>25</sup>.

## 144 **Selection of studies and analysis**

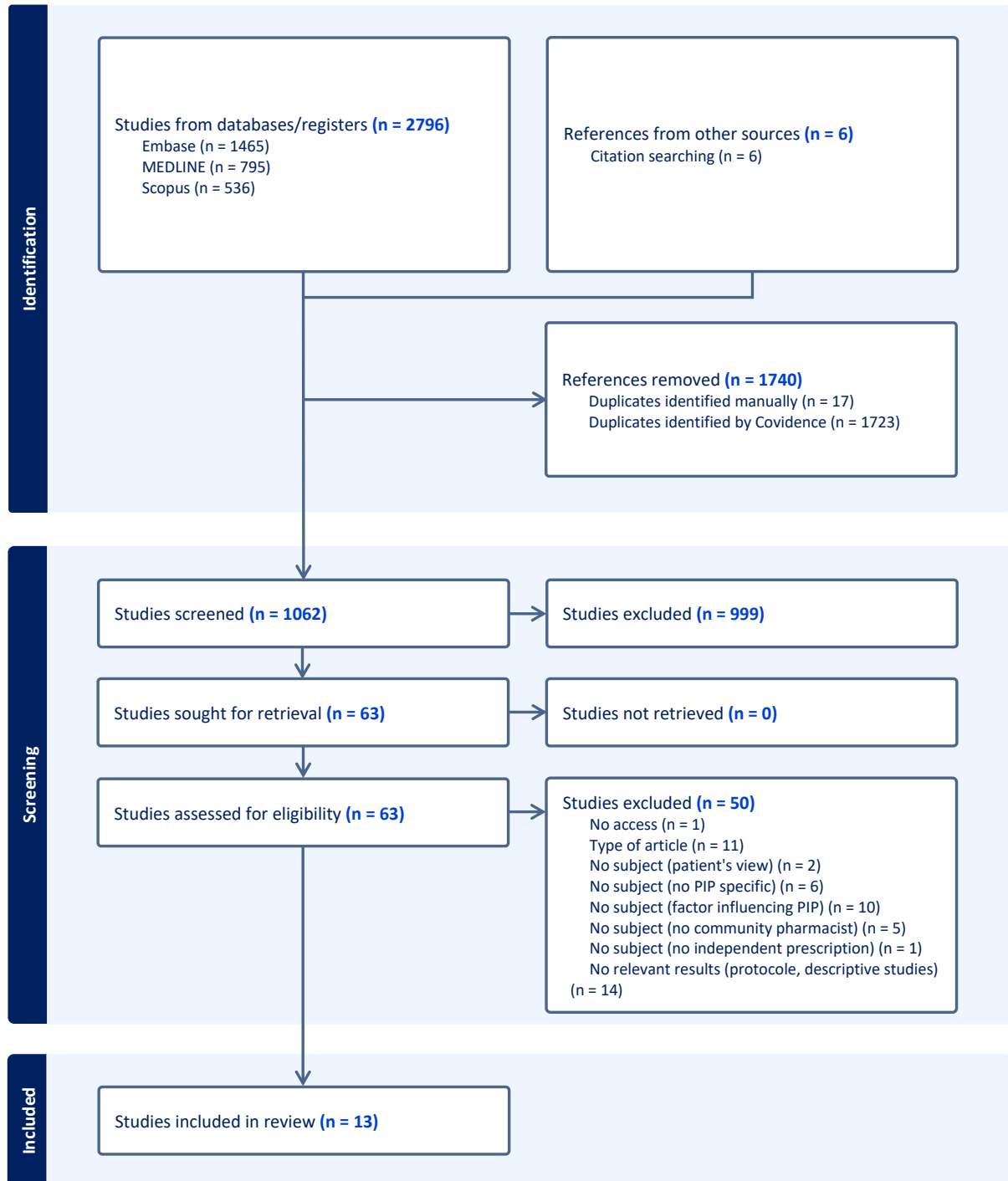
145 The studies were included in three steps. First, titles and abstracts were screened.  
146 Second, a full-text review was performed. Third, extraction and analysis were  
147 achieved. These steps were performed independently by the two reviewers (AP and  
148 DB). A consensus was reached between the two reviewers at the end of each step,  
149 with a third available if necessary (SF). The criteria for screening and full-text review  
150 were entered into the software.

151 An iterative process was used to create the data chart. General information, such as  
152 the lead author, year of publication, title, and country, was collected. Some  
153 characteristics of the studies, such as the study objective, study design, level, scope,  
154 and key findings, were also collected. The two reviewers independently completed the  
155 data charting form and discussed the results. The results are presented in a table to  
156 allow comparison between the studies and to provide an overview. Key findings from  
157 each study were classified into categories to show the contribution of PIP.

158

## 159 **Results**

160 The search initially yielded 2802 articles, which were reduced to 1062 after duplicate  
 161 removal. In total, 999 articles were deemed irrelevant after title and abstract screening,  
 162 and 63 full-text studies were reviewed for eligibility. Of these, 50 were considered  
 163 irrelevant and were removed. Therefore, 13 studies were included in the scoping  
 164 review, and their data were extracted. All of the processes are shown in **Figure 1**.



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Figure 1. Study flow diagram

## Characteristics of the included studies

All of the included studies were recent (from 2013 to 2023) and were mostly from Canada (8/13). Two studies were carried out in the United Kingdom, two in the United States, and one clinical study in Australia. A quantitative approach was used for ten studies.

Most studies included prospective data from clinical trials or retrospective data from public databases. Minor conditions were most often studied (5), although few interventions concerned cardiovascular diseases (3). Half of the studies reported PIP efficiency (7), four evaluated its efficacy, and only two studies reported PIP effectiveness (Table 1).

## Results of individual studies

The main findings from this scoping review about independent community pharmacist prescribing are available in Figure 2.

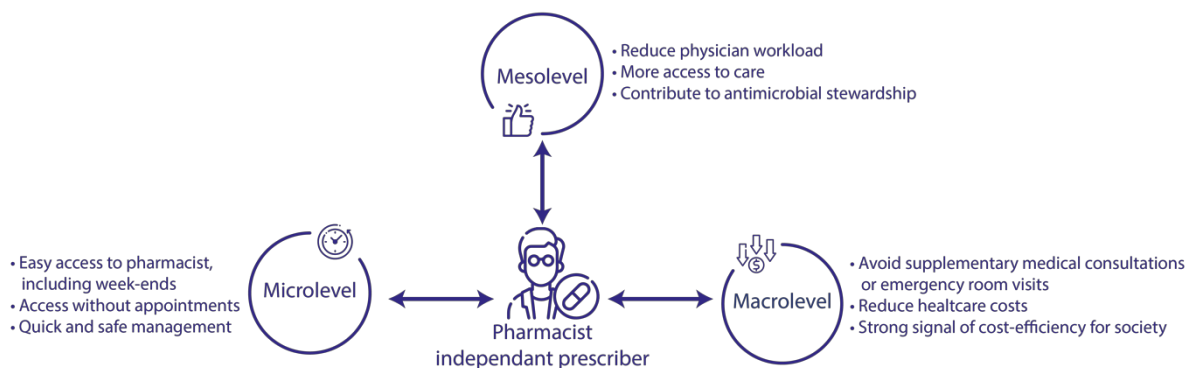


Figure 2. Key messages from the scoping review on PIP.

184 **Microlevel**

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3 185 The impact of PIP on patients was investigated in 5 studies <sup>26-30</sup>.

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6 186 Reduced delays are a major benefit of PIP due to easy access to a community  
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8 187 pharmacist. Pharmacists are considered to have easy access to primary care. This is  
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11 188 the main argument put forward by the patients who use it <sup>28</sup>. For example, quick  
12  
13 189 management of a urinary tract infection is needed. Beahm et al. observed a significant  
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16 190 difference between the time to access a pharmacist and that to access a general  
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18 191 practitioner (GP) (1.7 days vs. 2.8 days, respectively;  $p=0.0153$ )<sup>28</sup>. Pharmacist  
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21 192 prescribing for minor ailments made it possible to avoid medical consultations (35.2%)  
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23 193 and even emergency room visits (3.4%) according to Mansell et al. <sup>26</sup> Patients justified  
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26 194 their choice to consult a pharmacist by the trust they gave them to treat minor ailments  
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28 195 (26.0%), a health condition that did not require a medical visit (20.3%) or easy access  
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31 196 to the pharmacist (17.2%). Booth et al. reported two relevant findings. First, patients  
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33 197 visiting a pharmacy for care were treated more quickly than those with a physician's  
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35 198 prescription. Second, one-third of patients cared for by a pharmacist were treated on  
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38 199 weekends, when medical offices were closed <sup>29</sup>. Patients reported the ease of  
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40 200 accessing a pharmacist, especially for those with a busy job. It allows easier access to  
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43 201 a health care provider without an appointment.

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46 202 The PIP can also improve the medication management of patients and prevent  
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48 203 negative health outcomes. Beahm et al. conducted a prospective clinical study and  
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51 204 found no significant difference in clinical cure or adverse events between the  
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53 205 pharmacist and physician arms <sup>28</sup>. These results were confirmed by Booth et al., who  
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56 206 reported no significant difference between GPs or pharmacy management in terms of  
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58 207 the time to resolution of symptoms <sup>29</sup>. This study assessing pharmacists' prescribing  
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208 of minor ailments supports these observations. Indeed, the patients' condition  
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2 209 improved in almost all cases (99.2%)<sup>26</sup>.

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5 210 In the Rx EACH study by Tsuyuki et al., the effectiveness of pharmacist interventions  
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7 211 on cardiovascular risk was measured<sup>27</sup>. In the intervention group, the pharmacists  
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9 212 prescribed medications or laboratory tests after performing a medication therapy  
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11 213 management review. Smoking cessation was greater in the intervention group.  
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13 214 Moreover, cholesterol levels were lower in the intervention group than in the control  
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15 215 group (lower LDL cholesterol, lower systolic blood pressure, and lower glycosylated  
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### 24 25 26 218 **Mesolevel**

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29 219 The benefits of PIP in terms of care organization were highlighted in 3 studies<sup>30–32</sup>.  
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31 220 The results show that PIP saves physicians time and makes their work more  
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33 221 comfortable.

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37 222 The 'Pharmacy First' model, which is available in the UK, was evaluated by Stewart et  
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39 223 al. with respect to three conditions: urinary tract infections, impetigo and exacerbation  
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41 224 of chronic obstructive pulmonary disease<sup>30</sup>. It was qualified to be quick, efficient, and  
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43 225 convenient. Physicians themselves found the service useful. One of the benefits was  
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45 226 the release of medical time, thus reducing the pressure on appointments and  
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47 227 subsequently the physician's workload. In some territories, notably Ontario, Canada,  
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49 228 PIP has reduced the workload of physicians and improved the ability of pharmacists to  
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51 229 provide services<sup>32</sup>.

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57 230 PIP can also reduce the inappropriate use of antibiotics in treating sore throats.  
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59 231 According to Lathia et al., a rapid antigen detection test for Group A Streptococcus is

232 performed on average in one-quarter of consultations by physicians <sup>31</sup>. In the two  
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2 233 Canadian provinces that allow PIP (Alberta and Ontario), the test completion rates are  
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4 234 92% and 75%, respectively. The management of sore throats by pharmacists could  
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7 235 improve the detection of 'strep throat' and therefore the appropriate use of antibiotics.  
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10 236 ***Macrolevel***

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13 237 A strong signal was observed in this scoping review regarding the cost-effectiveness  
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16 238 of the PIP model in different settings. More than half of the selected studies examined  
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18 239 the benefits of PIP to society <sup>31-38</sup>.

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21 240 For most of the studies, modeling showed that pharmacist intervention was a cost-  
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24 241 effective strategy. The study conducted by Kim et al. accurately quantified the savings  
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26 242 in the pharmacist prescribing model for minor ailments. With 30,000 patients, this  
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29 243 model would save 99 emergency department visits, 3,677 family physician visits, and  
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31 244 5,090 walk-in clinic visits <sup>35</sup>. From the public payer's perspective, pharmacist  
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34 245 management of simple urinary tract infection in women, contact dermatitis, and  
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36 246 conjunctivitis would result in cost savings of \$12.26, \$4.89, and \$9.27 per patient,  
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39 247 respectively. A U.S. study showed that \$654,740 could be saved if emergency  
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41 248 medications, such as albuterol sulfate or insulin pens, could be prescribed by a  
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43 249 pharmacist <sup>34</sup>. This would avoid the need for emergency services or the complications  
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46 250 associated with a lack of treatment.

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49 251 In Canada, Pojskic and colleagues investigated key stakeholders' perceptions of PIP.  
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51 252 For many of them, redirecting patients to pharmacists for minor reasons is a way to  
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54 253 reduce health care costs <sup>32</sup>. This reduction would be made possible by reimbursing the  
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56 254 costs of minor care to less expensive health care providers, such as pharmacists. For  
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59 255 example, 17.7% of patients who received pharmacist services in Canada for a minor  
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2 257 infection (n = 34) would have visited a physician or emergency department if this  
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5 258 service did not exist <sup>26</sup>. This alternative reduces the health-care costs. A randomized  
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7 259 controlled trial in Australia provided evidence of the added value of a pharmaceutical  
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10 260 intervention for minor conditions <sup>37</sup>. This study demonstrated the cost-effectiveness of  
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12 261 a pharmacist-led minor ailment service compared with usual pharmacist care. The  
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14 262 minor ailment service was more costly (+ \$7.14) but also more effective in terms of  
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16 263 symptom resolution and quality-adjusted life year (QALY) gain (+ 0.003 QALYs). A  
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19 264 positive incremental cost-effectiveness ratio of \$2,277 per QALY was observed.

20 264 An economic evaluation of severe sore throat treatment by community pharmacists  
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22 265 was conducted by Lathia et al. in five Canadian provinces<sup>31</sup>. Depending on the  
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25 266 province, cost savings of \$12.47 to \$24.36 per patient are expected if the pharmacist  
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27 267 manages the sore throat. Savings of \$1.3 to \$2.6 million per year are projected for the  
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30 268 five provinces. Rafferty's study focused on the province of Saskatchewan, Canada,  
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32 269 and supported these results <sup>36</sup>. From a societal perspective, pharmacists prescribing  
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35 270 for minor ailments saved approximately \$800,000 in 2014. These cost savings were  
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37 271 estimated to be approximately \$3.5 million after 5 years.

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39  
40 272 Al Hamarneh et al. reported that pharmacist care was associated with a gain of  
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42 273 576,689 QALYs and avoided more than 8.9 million cardiovascular events <sup>38</sup>. They also  
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45 274 found that this service could save more than \$4.4 billion over 30 years. Another  
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47 275 economic evaluation was carried out in the United States and focused on blood  
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50 276 pressure control by a pharmacist <sup>33</sup>. Pharmacist intervention would prevent 2100 cases  
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52 277 of cardiovascular disease and 8 cases of kidney disease per 10,000 patients over thirty  
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55 278 years. On an individual basis, the intervention would save more than \$10,000 per  
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57 279 patient. Extrapolation of the modeling yielded savings of over \$1 trillion and 30.2 million  
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60 280 life-years saved over 30 years with a 50% access rate.

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## 282 Discussion

283 This study focused on patients (microlevel), organizations (mesolevel), and society  
284 (macrolevel)<sup>39</sup>. It, therefore, allows us to look at the larger picture and provide a more  
285 comprehensive answer to our research question. As an independent prescriber, the  
286 community pharmacist can intervene at different levels of patient care. The three types  
287 of benefits identified were improved: access to care, reduced physician workload, and  
288 cost savings for the health system.

### 289 Microlevel

290 Pharmacies are known to be accessible and available without appointment<sup>40</sup>. These  
291 criteria are often the first step in the chain of care and are sometimes the main link to  
292 the health care system<sup>41</sup>. This is one of the arguments that has led public authorities  
293 to extend community pharmacists' competencies, especially when medical time is  
294 limited or insufficient<sup>32,42,43</sup>.

295 Although there are various reasons why health authorities authorize PIP, the main  
296 benefit is for patients. A few studies have assessed patient satisfaction with PIP. The  
297 results show that patients trust the pharmacist and recognize his or her competence  
298<sup>17,26,44,45</sup>. They were satisfied with the service, both the ease and speed of access, and  
299 the quality of advice. These aspects are essential for patient acceptance of this new  
300 pharmacist role. One study reported that patients were convinced that their pharmacist  
301 prescribed medications as safely as their GP. Another indication of patient confidence  
302 was the strong recommendation to see a prescribing pharmacist<sup>44</sup>.

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## 304 Mesolevel

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3 305 In practice, pharmacists are often already managing patients with minor conditions who  
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6 306 are receiving OTC medications. In the UK, specially trained clinical pharmacists and  
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8 307 prescribing support teams work with general practices to support GPs and primary  
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10 308 care services. Maskrey et al. reported that clinical pharmacists are effective at  
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13 309 supporting physicians and helping them to free medical time <sup>46</sup>. The time spent on  
14  
15 310 prescribing activities was reduced by half. This saved medical time was accompanied  
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18 311 by increased patient safety and caregiver well-being. It should be noted that the right  
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20 312 to prescribe for pharmacists in the UK depends on where how, and what services are  
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23 313 provided. Another study exploring the views of UK GPs on their workload reported  
24  
25 314 several key findings. Although responsibility for patients was suggested, the delegation  
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28 315 of tasks was seen as essential for reducing physicians' workload. Expanding the role  
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30 316 of nonclinical staff and working with other health care professionals were also  
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33 317 suggested <sup>47</sup>. However, these changes in the scope of practice can also be challenging  
34  
35 318 for GPs and disturb their perception of their own work, at least during the skill mix  
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37 319 implementation phase in the UK <sup>48</sup>.

40 320 Patient safety can also be improved with PIP. When the pharmacist is a prescriber,  
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43 321 they need to follow some guidelines. One of the most famous examples is Canada,  
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45 322 with Bill 41 (*An Act to Amend the Pharmacy Act*) and Bill 31 (*An Act to Amend mainly*  
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48 323 *the Pharmacy Act to Facilitate Access to Certain Services*) integrated into the  
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50 324 Pharmacy Act in 2015 and 2020, respectively <sup>49–52</sup>. To prescribe some drugs for  
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53 325 specific conditions, pharmacists must undergo appropriate training. In addition, they  
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55 326 are required to follow guidelines that are validated beforehand by the health authorities  
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58 327 and the medical community <sup>14</sup>. The aim of these guidelines is to improve compliance  
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60 328 with the recommendations of all the involved professionals while ensuring that each

329 patient receives appropriate care. This process makes it possible to secure patient  
1  
2 330 care and ensure compliance with recommendations. Some drugs, such as antibiotics,  
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4 331 require specific precautions. Their misuse can be a source of noncure and, more  
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6  
7 332 widely, antimicrobial resistance <sup>53</sup>. The use of protocols or algorithms helps to limit this  
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10 333 risk.

## 13 334 **Macrolevel**

16 335 The cost-effectiveness of PIP seems to be the most explored aspect of this new  
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19 336 pharmaceutical service. Indeed, the cost-effectiveness of PIP is probably the most  
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21 337 important criterion from a societal point of view. Because medical time is more  
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24 338 expensive than pharmaceutical time, it may be more cost-effective to refer patients to  
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26 339 pharmacists than GPs <sup>32</sup>.

29 340 The lack of physician availability for a minor and acute ailment (e.g., acute cystitis) can  
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32 341 slow patient care and lead to inappropriate referrals to emergency services. Hospitals  
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34 342 are required to respond to this unscheduled demand for care, which does not require  
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37 343 a technical platform or specialized expertise. It should be noted that patients  
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39 344 themselves see PIP as a way to avoid visiting a GP or even the emergency room <sup>54</sup>.  
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41 345 Beyond PIP, pharmaceutical care has already been suggested to be cost-effective for  
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44 346 a specific pathology (e.g., hypertension <sup>55,56</sup>), a category of patient (e.g., elderly  
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46 347 patients <sup>57</sup>) or specific places (e.g., emergency department <sup>58</sup>). The incremental cost-  
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48  
49 348 effectiveness ratio per QALY of pharmaceutical care in the management of diabetes  
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51 349 and hypertension in elderly patients was evaluated in a prospective clinical trial in  
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54 350 Brazil <sup>59</sup>. Clinical improvements were observed in several areas (blood pressure,  
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56 351 fasting blood glucose, hemoglobin A1c, cholesterol, and 10-year coronary heart  
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59 352 disease risk). Nevertheless, the cost-effectiveness ratio remains positive, with an

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2 354 insignificant increase in overall health care costs with the addition of the  
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5 355 pharmaceutical care program. Patients' health outcomes and quality of life improved.  
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7 356 In the same way that pharmacists can initiate prescribing, they can also recommend  
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9 357 deprescribing through a physician. This includes medication reviews for older people  
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11 358 with polypharmacy. The cost-effectiveness of this service with follow-up was  
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13 359 demonstrated in community pharmacies in Spain with the conSIGUE study <sup>60</sup>. It is  
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15 360 considered an effective intervention to optimize prescribed medications and improve  
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17 361 patients' quality of life.  
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20 362 Globally, two recent systematic reviews of community pharmacist services (such as  
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22 363 medication reviews, type 2 diabetes mellitus services, hypertension management, and  
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24 364 adherence-focused services) concluded that these services were generally dominant  
25  
26 365 or cost effective compared to usual care <sup>61,62</sup>. Thus, the signal observed in our scoping  
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28 366 review regarding the cost-effectiveness of the PIP model seems to be in line with the  
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### 36 367 **Study limitations**

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40 368 This study was conducted rigorously, following the baseline methodology in  
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42 369 accordance with the PRISMA-ScR statement <sup>24</sup>. Some selection and classification bias  
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44 370 could be suspected but was reduced by the consensus methodology. In case of doubt,  
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46 371 the study was accepted for the next step and discussed between the two reviewers. In  
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48 372 addition, the inclusion of each study was monitored by two independent raters.  
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51 373 Although no geographic restrictions were imposed, most of the selected studies (8/11)  
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53 374 were from Canada. This reflects the history of the PIP model in that country. However,  
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55 375 this may limit the external validity of the study, especially in countries where access to  
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57 376 primary care is difficult.  
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377 It is important to note that the various results obtained cannot be directly extrapolated.  
378 Because each health care system has its own particularities, it is difficult to transpose  
379 results from one country to another. We can mention different working cultures, the  
380 presence of private insurance or social insurance, payment for services and service  
381 provision, etc.<sup>63</sup>. Moreover, the health care system may differ from one state to another  
382 (US) or from one province to another (Canada)<sup>63</sup>. As a result, the practice of PIP differs  
383 across countries. PIP may concern minor conditions but also more complex conditions,  
384 such as cardiovascular disease and diabetes. This finding supports the choice of a  
385 scoping review.

386 As explained in the introduction, PIP is the model that provides the most autonomy to  
387 pharmacists. A sociological study suggested that prescribing can be considered an  
388 indicator of autonomy<sup>64</sup>. However, this practice cannot be implemented everywhere,  
389 which is why stakeholders prefer to start with moderate practices, such as  
390 supplementary prescribing or dispensing under protocols<sup>9</sup>. This approach is  
391 considered a step forward. Indeed, these methods allow for greater acceptance by  
392 society, particularly the medical community<sup>4,15</sup>. There are many steps to take, and  
393 acceptance by the medical community is one of the major hurdles to overcome<sup>65,66</sup>.  
394 Patient safety arguments are often the first to emerge when physicians and  
395 pharmacists disagree about PIP<sup>67</sup>.

396 Edwards et al. conducted a review of the literature and identified several facilitators for  
397 the implementation of PIP; their work can be seen as a toolkit for stakeholders<sup>68</sup>. An  
398 interprofessional environment is naturally conducive to this kind of initiative and allows  
399 different actors to get to know each other<sup>69</sup>. Transitional measures are needed to  
400 accompany and support these new prescribers<sup>70</sup>. This includes a team culture with  
401 explicit role allocation. Moreover, access to patients' electronic health records has



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402 been proposed to reduce the risks associated with the shared management of the  
403 same patient. Moreover, beyond the possibility offered by the authorities, this practice  
404 must be accepted by the pharmacists themselves, and appropriate training must be  
405 defined <sup>15,71,72</sup>. Pharmaceutical independent prescribing can then be seen as a major  
406 expansion of pharmacists' skills, granting them medical autonomy.

407 Further research is needed to strongly assess the efficiency of PIP using more robust  
408 data. The extension of pharmaceutical prescribing around the world will also be a way  
409 to assess it in several countries with different health systems. Moreover, new models  
410 of pharmaceutical care, such as pharmacist primary care clinics in Canada, are  
411 emerging and will provide new data for assessing PIP <sup>73</sup>. To demonstrate the relevance  
412 of PIP worldwide, regardless of the health care system, it is important to provide more  
413 robust evidence. One way to achieve this goal is through pragmatic controlled trials or  
414 quasiexperimental studies. Once PIP has been implemented, it would be useful to  
415 measure the impact of this model through a pharmacoeconomic analysis based on  
416 retrospective data from the health care system in question. These objective data will  
417 be the key to implementing this model in new countries. In all cases, it is important to  
418 define the choice of outcomes at the outset of the study and to ensure their  
419 reproducibility using internationally accepted and validated outcomes <sup>74,75</sup>.

## 420 **Conclusion**

421 This study demonstrated the potential value and relevance of PIP. Minor ailments were  
422 frequently encountered in this scoping review, but they did not define the scope of an  
423 "independent prescriber pharmacist". Indeed, PIP has been implemented and may  
424 also be of interest for chronic conditions. The benefits to society are observed at all  
425 levels: micro, meso, and macro. The beneficiary of this service remains the patient, for

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426 whom accessibility is improved and delays before consultations are reduced. In  
427 addition, its safety is maintained and even improved. Finally, this service has been  
428 found to be cost-effective in some health care systems. It reduces the cost of care for  
429 patients and increases their quality of life. Effectiveness and efficacy seem to be  
430 established in some contexts, and a strong signal of efficiency is observed. However,  
431 further studies are needed to validate these findings.

## 432 **Declarations**

### 433 **Ethics approval and consent to participate**

434 Not applicable.

### 435 **Consent for publication**

436 Not applicable.

### 437 **Availability of data and materials**

438 The datasets used and/or analyzed during the current study are available from the  
439 corresponding author upon reasonable request.

### 440 **Competing interests**

441 The authors declare that they have no competing interests.

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### 445 **Author contributions**

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446 AP conceived the study, and AP and DB developed the study protocol. AP conducted  
447 the literature searches and wrote the first draft of the manuscript. DB reviewed the  
448 manuscript for critical content. DB provided the visualization. ARR and SF supervised  
449 and reviewed the document.

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680 Table 1: Characteristics and results of the included studies. *Studies are presented by level of impact (micro, meso, macrolevel).*

Author	Year	Country	Aim of study	Study design	Level	Scope	Key findings
Mansell 26	2015	Canada	To determine whether patients prescribed medications for minor ailments by a pharmacist symptomatically improve within a set time frame.	Quantitative Interventional	Micro	Efficacy	Cold sores, insect bites and seasonal allergies were the most common minor ailment. The condition improved significantly/completely in over 80% of cases. Only 4% experienced bothersome side effects.
Tsuyuki 27	2016	Canada	To evaluate the effectiveness of a community pharmacy-based case finding and intervention on cardiovascular risk.	Quantitative Interventional	Micro	Effectiveness	The Rx EACH study found a significant reduction in cardiovascular risk with the pharmacist intervention: 21% reduction in only 3 months.

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							In the intervention group, LDL cholesterol (-0.2 mmol/l), systolic blood pressure (-9.37 mmHg), and glycosylated hemoglobin (-0.92%) significantly decreased.
Beahm <sup>28</sup>	2018	Canada	To evaluate the effectiveness, safety with pharmacist prescribing and care in patients with uncomplicated urinary tract infection.	Quantitative Interventional <i>(prospective registry trial)</i>	Micro	Efficacy	Clinical cure was achieved in 88.9%, and no significant differences in clinical cure or in terms of adverse events were observed between the two arms.  The management of uncomplicated urinary tract infection by pharmacists is effective and safe.

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Booth <sup>29</sup>	2013	UK	To compare the care pathway of patients with urinary tract infection symptoms attending GP services with those receiving management, including trimethoprim supply under patient group direction, via community pharmacies.	Mixed method Interventional	Micro	Efficacy	No significant differences in the time to resolution of symptoms between patients receiving a prescription from the physician (n = 97) and those receiving pharmaceutical management (n = 56) were observed. The duration of symptoms before treatment was shorter for patients presenting for pharmaceutical management.
Stewart <sub>30</sub>	2018	UK	To evaluate the initiative from the perspective of patients, GP practices and pharmacists; to determine whether the referral	Mixed method Interventional	Micro Meso	Efficacy	1189 cases were managed by pharmacists, of which 78% resulted in a prescription for treatment by the pharmacist, 9%

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			<p>system was used appropriately;  and to review the clinical areas covered.</p>				<p>received advice only, and 13% were referred to the general physician.  Two thirds of GPs (67%) and 59% of reception staff found the service useful, mainly because it reduced pressure on GP appointments.</p>
Lathia <sup>31</sup>	2018	Canada	<p>To conduct an economic evaluation of treating severe sore throat when a program for evaluating this condition was offered in community pharmacies.</p>	<p>Quantitative <i>(Pharmaco-economic modeling)</i></p>	<p>Meso  Macro</p>	<p>Efficiency</p>	<p>In a scenario where 60% of patients with severe sore throat seek care in a community pharmacy, the health care system saves a mean of \$12.47 to \$24.36 per patient.</p>

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Pojksic <sup>32</sup>	2014	Canada	To understand the factors influencing the genesis and formulation of the pharmacist prescribing policy in Ontario.	Qualitative	Meso Macro	Effectiveness	Pharmacy professional organizations and the Ontario government representatives see PIP as a way to improve patient access to primary care.
Dixon <sup>33</sup>	2023	US	To estimate the cost-effectiveness of implementing a pharmacist-prescribing intervention to improve BP control in the US.	Quantitative <i>(Pharmacoeconomic modeling)</i>	Macro	Efficiency	A 50% uptake of a pharmacist-prescribing intervention to improve blood pressure control was associated with \$1.137 trillion in cost savings and could save an estimated 30.2 million life years over 30 years, with 2100 fewer cases of CVD and 8 fewer cases of kidney disease per 10,000 patients.

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							The cost savings were \$10,162 per person due to fewer CV events.
Shakya <sup>34</sup>	2023	US	To describe the prescriptive behavior of pharmacists in Idaho after the state expanded prescriptive authority for a select set of minor, managed, or emergency conditions.	Quantitative Observational <i>(modeling)</i>	Macro	Efficiency	Approximately one additional Medicare beneficiary per pharmacist received albuterol sulfate (roughly 6% of the asthmatic population) and two received insulin pen needles (roughly 11% of the diabetic population) annually after the expansion of prescriptive authority for pharmacists. If just 10% of these missed medications resulted in an

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							emergency, it would have cost families an estimated \$654,740.
Kim <sup>35</sup>	2021	Canada	To estimate the potential economic impact of establishing a remunerated program for pharmacists prescribing for minor ailments from a public payer perspective in Ontario.	Quantitative Observational <i>(modeling)</i>	Macro	Efficiency	At a service uptake rate of 38% for the prescription-detached scenario, the PPMA model led to savings of \$7.51, \$4.08, and \$5.15 per patient for upper respiratory tract infections, contact dermatitis and conjunctivitis, respectively.
Rafferty <sup>36</sup>	2017	Canada	To perform an economic impact analysis of the pharmacists prescribing for minor ailments program in Saskatchewan and savings of the program for a time	Quantitative Observational <i>(modeling)</i>	Macro	Efficiency	Pharmacists prescribing for minor ailment program was cost saving from a public payer perspective and much more so from a societal perspective. After

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			horizon of five years after implementation.				5 years of implementation, from a societal perspective, cumulative cost savings were projected to be \$3,482,660.
Dineen-Griffin <sup>37</sup>	2020	Australia	To assess the cost-utility of a minor ailment service, compared to usual pharmacist care.	Quantitative (cRCT)	Macro	Efficiency	An incremental cost-effectiveness ratio of \$2,277 per quality-adjusted life years was observed with the minor ailment service compared to usual pharmacist care.  Based on a reference threshold of \$28,033 per quality-adjusted life year, the implementation of the minor ailment service in



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							Australia is a value for money intervention.
Al Hamarne h <sup>38</sup>	2019	Canada	To evaluate the economic impact of pharmacist prescribing and care for cardiovascular risk reduction in a Canadian setting.	Quantitative (modeling)	Macro	Efficiency	Pharmacist care could save more than \$4.4 billion, add 576,689 quality-adjusted life years, and prevent more than 8.9 million cardiovascular events over 30 years compared to usual care if applied to only 15% of eligible adults in Canada.

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