Pharmacists in general practice – What do they do?
A qualitative case study

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Abstract

Background

Pharmacists working in general practice are a relatively new phenomenon in many European countries. Providing insight into what pharmacists do in general practice may support further implementation of general practice-based pharmacists and their contribution to health care.

Aim

To explore the tasks performed by pharmacists in general practice in Sweden.

Method

A case study was conducted in 7 general practices in Region Uppsala, Sweden, where a pharmacist was employed. Activities other than medication reviews performed by pharmacists were self-reported during March 2021. Participant observations of and semi-structured interviews with pharmacists were conducted between October and November 2021. Self-reported activities were categorised and analysed using descriptive statistics. Qualitative data were analysed with conventional content analysis.

Results

In total, 174 activities were self-reported by 7 pharmacists. Two pharmacists were observed for 2 days each, and 6 pharmacists were interviewed. Their main task was conducting medication reviews in older patients with polypharmacy. In addition, they handled a broad variety of drug-related questions and treatment follow-up. Pharmacists described working in a more efficient and need-based manner over time. They stressed that working at the practice increased their accessibility for and to other healthcare professionals, and enabled them to meet patients face-to-face. Future challenges include defining tasks more clearly, assuming greater responsibility for patient care, and meeting the growing demand for pharmacists in general practice.

Conclusion

Pharmacists in general practice in Sweden perform a broad variety of tasks related to identifying, resolving and preventing drug-related problems, mainly in older patients with polypharmacy.

Impact statements

- This study provides a better understanding of the work of pharmacists in general practice, which supports further implementation and integration of general practice-based pharmacists
- An overview of the broad variety of pharmacists’ drug-related tasks may facilitate definition and clarification of the scope of pharmacists’ practice in primary care
This study indicates that future research should focus on the development and implementation of advanced tasks in general practice, such as responsibility for the evaluation of treatment effects in certain patients.

Introduction

The aging population and increased prevalence of multimorbidity result in the prescription of more medications and thereby complex pharmacotherapy [1]. This complexity may lead to individual therapies becoming inappropriate and even harmful, putting pressure on healthcare systems [2]. At the same time, there are increasing shortages of physicians and nurses in many countries [3]. In primary care – central to the provision of health care and a gatekeeper to hospital care – general practitioners (GPs) are experiencing an increased workload, challenging the provision of high-quality care [4–6]. Pharmacists, who are qualified medication experts with a range of knowledge and skills, have been introduced in general practice to cope with this challenge [7]. Evidence suggests that pharmacists can provide valuable services to ease the burden on general practice in addition to improving patient safety and health outcomes [8, 9]. Some countries, e.g., Australia, the United Kingdom and Canada, seem to have well-established general practice-based pharmacists compared to other parts of the world. The pharmacists in these countries undertake a range of activities such as medication reviews and management of chronic conditions [10]. In many European countries, e.g., Sweden, the concept of pharmacists in general practice is relatively new, and literature on the work they do is scarce. A better understanding of pharmacists’ current tasks can promote further implementation of pharmacists in general practice in other regions and countries, increasing their contribution to high-quality care and patient safety.

Aim

The aim of this study was to explore the tasks performed by pharmacists in general practice in Sweden.

Methods

Study design

This study employed a qualitative case study approach including 3 data-collection methods: self-reported tasks, participant observation and semi-structured interviews. A case study is an in-depth study of a phenomenon within a specific social system (a case) in its real-life context [12]. For this study, the case of pharmacists in general practice within Region Uppsala, Sweden, was investigated, with focus on the tasks that these pharmacists perform.

Setting

Region Uppsala is responsible for the health care of all 390,000 inhabitants in Uppsala County [13] and operates about half of all general practices within the county. Since 2019, Region Uppsala has invested in permanent pharmacist positions within general practice to improve medication use and safety in primary
care. The main idea was that these pharmacists would conduct medication reviews to identify, resolve and prevent drug-related problems (DRPs) in older patients using multiple medications (polypharmacy). Other tasks could be performed based on the needs and prerequisites of the specific workplace. For this study, all 7 general practices where pharmacists were working, either physically or remotely, within Region Uppsala at the time of the study were included. One of these practices, the geriatric outpatient unit, was for people aged 65 years or older with chronic conditions who had difficulties accessing their general practice. The other 6 practices were considered standard general practices with between 8,000 and 19,000 listed patients.

Sampling and recruitment

The 9 pharmacists working at or for the general practices constituted the potential study population. For the self-reported tasks and interviews, all 8 pharmacists working in general practice within Region Uppsala during the data collection period were approached and agreed to participate (one pharmacist being on parental leave during each part). For the observations, 2 pharmacists were recruited. They were chosen because they had at least a full year’s experience of working in general practice and were on location despite the ongoing Covid-19 pandemic. Additionally, we aimed for a semi-structured interview with one pharmacist from each of the general practices, including those who had been observed.

Data collection

Tasks were self-reported by all pharmacists working during the full month of March 2021. They were instructed to report, on a daily basis, all tasks performed including requests from other healthcare professionals (HCPs), besides their main task of conducting medication reviews. Non-clinical work (e.g., participating in workplace meetings) was excluded. For each task, the following information was reported in an online shared Microsoft Excel spreadsheet: date, one-sentence description of the task and who initiated/requested the task.

Participant observation and semi-structured interviews were conducted between October and November 2021 by the second author (RK). Each of the two pharmacists were observed during two full working days. The observations were unstructured to allow an inductive approach where the tasks performed by pharmacists were primarily based on the data from the observations. An observation protocol, adapted from a previous study [14], was used to note what tasks or activities the pharmacists performed, including when, how, where and with whom they interacted (Supplementary material). Apart from observations, the researcher also noted her own thoughts and interpretations, as well as information provided by the pharmacists during informal interviews.

For the semi-structured interviews, an interview guide was developed in accordance with Jacobs et al. [15]. The interview questions concerned the pharmacist’s tasks and work activities, patient population, collaboration with other HCPs, workplace and setting as well as perspectives on the future development of and challenges for pharmacists in general practice (Supplementary material). The interviews took
place online through Zoom, were audio-recorded and transcribed verbatim by the same researcher (second author).

Data analysis

All qualitative data were analysed with conventional content analysis [16]. Self-reported tasks were analysed by the first author (TK) using an iterative approach involving familiarisation with the data, coding tasks and task groups. A second categorisation was performed concerning the medications (drug group or drug treatment) involved in each task, if such data were available. The free text data about who had initiated or requested the task were also categorised. Finally, the categorisations were analysed with descriptive statistics in Microsoft Excel.

Observation and interview data were thematically analysed by the same researcher (RK) who had collected the data together with one of the other researchers (SKS for observation data and TK for interview data). Each pair of researchers first independently read the data to perform initial coding. Then, a discussion was held between the two researchers about conflicting codes to achieve consensus on a coding scheme and categorisation. RK then further categorised and (re)coded the data under the supervision of one of the other researchers. Afterwards, the third researcher (TK for observation data and SKS for interview data) critically reviewed the results. Finally, the results of the observations were incorporated in the themes and categories that emerged from the interviews, as all observations fitted into the interview themes and categories.

Research team and trustworthiness

All observations and interviews were performed by a final-year pharmacy student without prior experience of qualitative research (RK). Before the study, she received an introduction to qualitative research (by SKS) and familiarised herself with the basic concepts of participant observation and semi-structured interviewing. SKS is a social scientist with extensive experience of qualitative research within pharmacy practice. TK is a pharmacist and postdoc researcher in social pharmacy. He worked as a pharmacist in general practice in Region Uppsala during the time of this study, hence participating in the self-reporting and in a semi-structured interview. He is trained and experienced in qualitative research.

A process of member checking by participating pharmacists was employed in September 2022. All pharmacists working in general practice within Region Uppsala were sent a summary of the study findings and invited to provide reflections to verify the description of the tasks identified. SKS and TK held an online discussion with the pharmacists via Zoom, during which the pharmacists provided feedback on the study findings. The study findings were adapted accordingly. An audit trail of participant recruitment, data collection and analysis was kept by RK to trace the course of the study. The Standards for Reporting Qualitative Research were adhered to [17].

Results
Self-reported tasks

In total, 174 tasks were reported by the pharmacists (Table 1). Of these, 161 were requested by other health professionals: 124 (76%) by GPs, 26 (16%) by nurses and 13 (8%) by either an assistant nurse, dietician, general practice manager, medical secretary, midwife or patient. The most frequently reported task was a drug-related request or problem concerning an individual patient (n = 80, 46%), followed by questions about the electronic health record (EHR), the multidose drug dispensing (MDD) system or about licences for non-registered drugs (n = 41, 24%; e.g., how to change a prescription to MDD).

[Insert Table 1 here]

In 106 cases, the drug group or drug treatment involved was reported (Table 2). Pharmacists described dealing with requests or problems related to all kinds of pharmacotherapy relevant to primary care. The most frequently involved drug group or treatment was antidepressants and anxiolytics (n = 16; 15%), followed by pain treatment (n = 12; 11%).

[Insert Table 2 here]

Participant observation and semi-structured interviews

The 2 pharmacists who were observed and interviewed had 2 and 13 years of clinical experience, respectively, in health care. One had obtained a formal post-graduate clinical pharmacy degree. Additionally, 4 pharmacists who worked in different general practices, including the geriatric outpatient unit, were interviewed (Table 3). These pharmacists had 5 to 20 years of clinical experience and one had obtained a post-graduate clinical pharmacy degree.

[Insert Table 3 here]

An example of a working day, based on the observations, is presented in Box 1. Other findings from the participant observation are incorporated in the 5 themes and multiple categories that emerged from the semi-structured interviews (Fig. 1). These themes and categories are described below, supported by illustrative quotations from the interviews (P1-6).
Box 1. An example of a pharmacist’s typical working day in general practice, based on the observations.

8:45h Pharmacist begins the day by checking the post-box and starting the computer to check the appointment schedule and messages in the EHR system. Prepares for the first medication review and/or dealing with a drug-related question.

9:00h Coffee break, mainly to meet and quickly catch up with other HCPs who take a break at that time.

9:15h Further preparation and accessing different information sources (e.g., medical history and laboratory results in the patient’s EHR or treatment guidelines) to deal with questions received through the EHR system and/or prior to patient contact. Writes answers to questions that can be handled directly through the EHR messaging system.

9:45h Phone call to a patient who had a question about whether there are any interactions between prescribed medications and vitamin products that the patient is taking. Makes a note in the patient’s EHR to document what was discussed during the phone call.

10:00h A patient visits the pharmacist for medication reconciliation as part of a medication review. After the reconciliation, the pharmacist walks to the GP’s room to inform about the potential change in pharmacotherapy that was discussed with the patient. Documents the discussion with the GP, writes a preliminary note in the patient’s HER, including the results of the medication review.

11:00h A nurse knocks on the door and asks about which of a patient’s medications can be crushed, because the patient has difficulties swallowing certain tablets.

11:15h Phone call to a patient to answer her/his question regarding possible side effects of a drug she/he is taking.

11:45h Checks the e-mail and Microsoft Teams group to respond to questions from pharmacist colleagues.

12:00h Lunch break including quickly discussing with another HCP about a patient case and asking for clarification about a previous request. A GP asks the pharmacist to help with reporting an adverse drug effect to the Swedish MPA.

12:45h Phone call to a patient to follow up on the (side) effects of antihypertensive treatment that had recently been changed.

13:00h Logs into the web-based system to deal with requests for repeat prescriptions. Assesses and processes requests made by 12 patients. Walks to the nurses’ room to ask about how to process one specific request.

14:00h Another patient visit in the context of a medication review, specifically addressing the patient’s inhaler technique. Pharmacist explains the difference between different inhalers and proposes substituting one inhaler. After the patient visit, the pharmacist writes a message to the GP with a specific proposal regarding the substitution.

14:30h Logs into the EHR referral system to deal with a request from a GP in a different practice for a medication review for a specific nursing home patient. The pharmacist performs the medication review based on the information received in the referral, the patient’s EHR and the MDD system. Writes pharmacotherapy recommendations in the patient’s EHR and as a response to the GP’s request.

15:15h Finalises notes, sends messages in the EHR system that were not dealt with during the day and forwards the adverse drug effect report to the MPA.

15:45h Pharmacist goes home.
EHR, electronic health record; GP, general practitioner; HCP, healthcare professional; MDD, multidose drug dispensing; MPA, medical product agency

Theme: Tasks

Medication review and reconciliation

Performing medication reviews was the pharmacists’ “main job” (P1) in general practice, which was both observed and stated by the pharmacists. Often, the reason for performing a medication review was a specific DRP (e.g., a suspected adverse drug effect) or a patient’s complex pharmacotherapy. Pharmacists also performed reviews prior to an appointment for a yearly check-up by the GP.

Medication reconciliation, the process of ensuring a correct medication list, was the first step of a medication review. This process was often combined with a discussion with the patient (or caregiver) about the indication(s) for drug treatment, how and when to take the medications, any DRPs (e.g., non-compliance issues) and any recommendations to optimize treatment. Medication reconciliation could also be requested and performed as a single task to reduce the GPs’ workload. For example, this was done by the pharmacist before the introduction of an MDD system or after hospital discharge. Some pharmacists were able to correct and prepare the patient’s medication list in the EHR for the GP to approve and prescribe.

We observed that both before and after medication reconciliation, pharmacists spent time assessing different information sources (e.g., medical history and laboratory results in the patient’s EHR or treatment guidelines) to thoroughly review the patient’s pharmacotherapy, find solutions for identified DRPs and optimize the patient’s treatment. Pharmacists also made notes in the EHR after each contact with a patient.

Specific drug-related questions

Many activities involved answering specific drug-related questions. According to the pharmacists, any drug-related question could be dealt with (see Table 4 for examples from the observations). Sometimes questions were answered directly by the pharmacist, while other questions required the pharmacist to read the patient’s EHR, look at other information sources or contact the patient.

[Insert Table 4 here]

Treatment follow-up in individual patients

During the observations, both pharmacists carried out follow-up phone calls with patients, e.g., to evaluate the effect after discontinuing a certain drug or to address treatment adherence. Most pharmacists also mentioned that they frequently followed-up patients, either by telephone or by a visit.
One pharmacist mentioned measuring blood pressure and ordering laboratory tests to support follow-up, either as part of a medication review or in the process of handling requests for repeat prescriptions.

“I take the initiative for some tasks, others I sort of get assigned by them [doctors and nurses] where it’s booked in my schedule, like today I have to contact this patient who has increased his medication.” – P6

Questions about the EHR or MDD system

Pharmacists supported other HCPs when they had questions about different drug-related digital systems or modules, which was also the subject of observations. GPs and nurses relied on the pharmacist’s expertise when initiating or making changes to the MDD system.

Repeat prescriptions

Three pharmacists (one of whom was observed) reduced the workload of nurses by performing some of their work regarding repeat prescriptions via a web-based portal or by telephone. Neither nurses, nor pharmacists are authorized to renew prescriptions, so an assessment was made whether the renewal could be sent directly to the GP to sign or if it required a further GP assessment.

“On Mondays [...] there is usually a lot for the nurses to take care of [...] so I generally step in and reduce the load of prescription renewals as much as I can.” – P2

Other tasks

Pharmacists mentioned updating and educating other HCPs about drug-related news or changes in local guidelines. Some had also supported the development of medication management routines at the general practice.

Theme: Workplace and way of working

Importance of working at the practice and patient contact

One of the observed pharmacists had a separate room in the general practice, while the other was dependent on a spare GP room that could differ each day. Most pharmacists mentioned the importance of working at the practice, which enhanced the pharmacist’s work in different ways: increased accessibility of and being there for other HCPs, having face-to-face patient contact and being able to join in multidisciplinary meetings and rounds (e.g., diabetes rounds with a GP and nurse).

“I had a room next to the reception and between different doctors, so everyone could find me. Generally, I was there three days a week, those were fixed days, so they knew which days I was there, otherwise it wouldn’t work.” – P5

Medication reconciliation with patients was preferably performed in person at the practice, but could also be carried out by telephone. The pharmacists had no direct contact with nursing home residents and
geriatric outpatients. Instead, a validated form to identify possible drug-related symptoms was often filled in by the carer with or on behalf of the patient. This provided a basis for medication reconciliation, combined with data from the EHR and MDD system. Although it was considered “valuable to see when patients [...] show their medications at home” (P4), pharmacists rarely visited patients at home, because it was “time consuming” (P2).

Remote work for other practices and nursing homes

Referrals for medication reviews or other requests could be sent by HCPs from all general practices in the region through the EHR system. These requests were then answered through the same system.

“So, what I do here is that I work with the patients in the geriatric outpatient unit and then I respond to referrals from GPs from across the region.” – P3

From an unknown to a useful resource, more need-based work

When pharmacists started working at their practice, much time was spent on actively looking for patients to invite them for medication reviews. Pharmacists explained that they had become more efficient and useful over time, working in a more need-based manner as HCPs started to reach out to the pharmacists with all kinds of requests.

“They have started understanding what you can use a pharmacist for, but it takes some time for them to feel comfortable asking all types of questions.” – P6

Theme: Collaboration and communication with other HCPs

Most collaboration with GPs and nurses

As mentioned by the pharmacists and as observed, they mostly collaborated with the GPs and nurses “obviously [...] because they work closest to medications” (P3). Requests were usually made through the EHR messaging system, written notes or in person. When working at the general practice, pharmacists, GPs and nurses could easily discuss patient cases and pharmacists could provide pharmacotherapy recommendations or answer questions.

Collaboration with HCPs other than GPs and nurses

Dieticians, physiotherapists, psychologists and social workers were most often mentioned by the pharmacists as other HCPs, apart from GPs, with whom they collaborated. For example, “This patient is on all these pain medications, is that reasonable?” (P4) would be a common question from a physiotherapist.

“I would say that there is no [profession] that I don't work with, but I work with some more than others.” – P6
Collaboration with other pharmacists

Pharmacists could contact community pharmacists about prescription errors in individual patients or in the event of drug shortages. However, they mainly consulted their colleagues in primary or hospital care to discuss patient cases and drug-related questions. The pharmacists in primary care felt like a group that supported each other.

“We have a great chat group [...] and it is worth its weight in gold. [...] You receive excellent help and quick answers.” – P4

Theme: Patient population

All conditions and mostly older patients with polypharmacy

Pharmacists managed “all possible clinical conditions” (P3) treated in primary care. Two of them mentioned being more specialised: one in inhalers and inhalation technique for chronic lung disease patients and one in anticoagulant treatment for patients with atrial fibrillation or deep vein thrombosis. Although pharmacists dealt with patients of all ages, they particularly focused on older patients in relation to polypharmacy.

“We have decided that all patients admitted to the geriatric outpatient unit and all patients who come for yearly check-ups should receive a medication review.” – P2

Theme: Future tasks and challenges

Structured and clear task description

The task description for pharmacists in general practice seemed unclear both to the pharmacists themselves and to others, according to the pharmacists. Pharmacists stated a need for a clearer definition of tasks, enabling a more effective way of working. They wanted decisions about which tasks to prioritize to be made at leadership or policy level. At the same time, specific tasks should be adapted locally because “different general practices have different needs” (P4).

“It's time to define which patients, which type of questions you are to deal with so that it's clear to others.” – P5

More responsibility for patient care

In order to work more effectively in the future, most pharmacists wanted more responsibility and autonomy regarding patients’ treatment. For example, responsibility for evaluating the effects after the start or change of pharmacotherapy. The pharmacists stated that gaining the right to prescribe in certain situations would make this possible in the future, but would need to be introduced gradually and carefully.
“I believe that we can relieve the doctors of many tasks in the future, but it must happen gradually so that they are on board. I can imagine [...] that we could be given the right to prescribe, renew some prescriptions, but that is far in the future.” – P4

Growing need for pharmacists, but recruitment is challenging

Pharmacists experienced lack of time and resources as one of the main challenges in their work. With an increased understanding of what pharmacists can contribute, the need for pharmacists and their services seems to be growing and becoming “inexhaustible” (P6).

“Right now, our challenge is that there should be more of us, it’s difficult to recruit experienced pharmacists, the demand is increasing rapidly in primary care.” – P3

Discussion

This study employed a case study approach with data from self-reported tasks, participant observations and semi-structured interviews to investigate what tasks pharmacists perform in general practice in Region Uppsala, Sweden. In addition to conducting medication reviews in older patients with polypharmacy, pharmacists handled a broad variety of drug-related requests and problems for which they mainly collaborated with GPs and nurses.

Similar to the findings from a 2019 systematic review mainly based on studies from the USA [10] and recent studies in the UK [18], Ireland [19] and the Netherlands [20], pharmacists in Region Uppsala mostly performed tasks related to medication management (e.g., medication reviews, DRPs and repeat prescriptions), hence were involved in detecting, resolving and preventing DRPs. In countries with prescription rights for pharmacists, medication management also included prescribing activities, which was an option carefully considered for the future by some pharmacists in this study [10]. Other activities were related to collaboration with various HCPs, acting as a liaison between general practice and community pharmacy, counselling and educating patients and other HCPs as well as participating in research (e.g., this study) [10].

Pharmacists in Region Uppsala seemed to perform fewer tasks related to patient examination and screening (e.g., ordering and reviewing laboratory tests and physical examination) as well as formal chronic disease management (e.g., formulating and following-up on care plans for patients) compared to reports in other studies [10]. These activities seem to require a higher degree of autonomy and responsibility for patient care. Similar to previous studies in Canada [21, 22], pharmacists in the present study expressed a desire to perform such tasks in the future, consequently taking more responsibility for patient care. Systematic reviews on the effects of pharmacist services in general practice appear to report more favourable results in studies involving pharmacists in the follow-up of patients, rather than delivering medication reviews, education or drug information in isolation [8, 9].
Activities related to auditing and quality assurance are commonly reported by general practice pharmacists in different countries [10, 18, 20]. In this study, these activities were rarely performed but mentioned as potential tasks. However, pharmacists stressed that it would be impossible to perform all these activities, as there were too few pharmacists to meet the increasing demand in general practice. A clearer task description will likely enhance pharmacists’ contribution in general practice, as successful multi-professional collaboration and teamwork are dependent on understanding each other’s roles [23, 24]. At the same time, general practices have different needs, hence efficient use of pharmacists will likely include performing a variety of tasks [7]. The pharmacists in the present study felt that their work became more efficient and useful over time, as other HCPs understood what pharmacists could contribute. They adapted their work to local needs, hence becoming more integrated in the general practice. The presence of a pharmacist in the practice is essential for such local work adaptation and successful collaboration with other HCPs [7, 20, 25].

Methodological strengths and limitations

Research trustworthiness and rigour [26] were addressed in diverse ways throughout the research process (Table 5). Some limitations also need to be considered. First, the number of pharmacists observed (n = 2) and interviewed (n = 6) is limited. However, member checking was performed, involving all pharmacists working in general practice in Region Uppsala at the time of the study. Second, data collection could have been influenced by the pharmacy-background of two of the researchers (TK and RK) and the participants themselves, possibly presenting a more positive description of pharmacists’ performance. This potential risk was mitigated by the involvement of a third researcher (SKS) with a social science background. In addition, the researchers chose to acknowledge their predispositions and tried to describe the tasks as reported and observed, leaving judgement of their value and relevance to the reader. Third, the study was carried out during the Covid-19 pandemic, which reduced the number of pharmacists working in general practice, possibly having a negative impact on their tasks, for example by fewer face-to-face patient contact.

[Insert Table 5 here]

Interpretation and implications

This study provides a better understanding of what pharmacists do in general practice, thus supporting further implementation and integration of general practice-based pharmacists. An overview of the broad variety of pharmacists’ drug-related tasks may facilitate definition and clarification of the pharmacists’ scope of practice in primary care. To enhance the pharmacists’ contribution to patient care, decisions should be made at policy or practice level about tasks that would require a higher degree of autonomy and responsibility. Future research may focus on the development, implementation and evaluation of such advanced tasks in general practice that include patient examination and screening as well as formal chronic disease management.
Conclusion

Pharmacists in general practice in Sweden perform a broad variety of tasks related to identifying, resolving and preventing drug-related problems, mainly in older patients with polypharmacy.

Declarations

Acknowledgements

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Conflicts of interest

The authors have no relevant financial or non-financial interests to disclose.

Author Contributions

All authors contributed to the study’s conception and design. Data collection (observations and interviews) was performed by RK. All authors were involved in the data analysis. The first draft of the manuscript was written by TK and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Data availability

The anonymised data generated and/or analysed during the present study are available from the corresponding author on reasonable request.

Ethical approval

Ethical considerations were made, informed consent was obtained from all individual participants and all data were deidentified during analysis and reporting to ensure the participants’ anonymity. According to the Swedish Ethical Review Act [11], no ethical approval was required for this study.

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Tables
Table 1
Pharmacists’ self-reported tasks (n = 174).

<table>
<thead>
<tr>
<th>Self-reported tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of times reported (% of total)</td>
</tr>
<tr>
<td>Manage drug-related request or problem concerning an individual patient</td>
</tr>
<tr>
<td>Drug selection in patient with complex treatment</td>
</tr>
<tr>
<td>Adverse drug effect or intolerance</td>
</tr>
<tr>
<td>Drug administration</td>
</tr>
<tr>
<td>Dosage regimen or drug titration</td>
</tr>
<tr>
<td>Drug-drug interaction</td>
</tr>
<tr>
<td>Contra-indication</td>
</tr>
<tr>
<td>Manage or answer a question about EHR/MDD systems or licences for non-registered drugs</td>
</tr>
<tr>
<td>Manage general drug-related request or problem</td>
</tr>
<tr>
<td>Availability or deregistration of product</td>
</tr>
<tr>
<td>Drug selection in patients with complex treatment</td>
</tr>
<tr>
<td>Drug cost</td>
</tr>
<tr>
<td>Adverse drug effect or intolerance</td>
</tr>
<tr>
<td>Contra-indication</td>
</tr>
<tr>
<td>Dosage regimen or drug titration</td>
</tr>
<tr>
<td>Drug-drug interaction</td>
</tr>
<tr>
<td>Not reported or unclear</td>
</tr>
<tr>
<td>Provide information or education to other healthcare professional(s)</td>
</tr>
<tr>
<td>Provide support with developing or updating local routines</td>
</tr>
<tr>
<td>Perform drug preparation for administration to patient</td>
</tr>
<tr>
<td>Participate in multidisciplinary team discussion</td>
</tr>
<tr>
<td>Participate in pharmacotherapy quality improvement project</td>
</tr>
</tbody>
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EHR, electronic health record; MDD, multidose drug dispensing
Table 2
Drug group or treatment involved in the self-reported tasks (n = 106).

<table>
<thead>
<tr>
<th>Drug group or treatment</th>
<th>Number of times reported (% of total&lt;sup&gt;a&lt;/sup&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antidepressants and anxiolytics</td>
<td>16 (15)</td>
</tr>
<tr>
<td>Pain treatment</td>
<td>12 (11)</td>
</tr>
<tr>
<td>Vaccinations</td>
<td>9 (8)</td>
</tr>
<tr>
<td>Diabetes treatment</td>
<td>9 (8)</td>
</tr>
<tr>
<td>Asthma and COPD treatment</td>
<td>7 (7)</td>
</tr>
<tr>
<td>Gastrointestinal treatment (PPIs, laxatives and flatulence treatment)</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Antihypertensives</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Antibiotics and antimycotics</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Lipid lowering drugs</td>
<td>5 (5)</td>
</tr>
<tr>
<td>Vitamins and iron supplements</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Dermatologicals</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Anticonvulsants</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Sleep disorder treatment</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Other cardiovascular drugs</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Osteoporosis treatment</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Oral antihistamines and corticosteroids</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Obesity treatment</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Other treatment (gout, hypothyroidism, incontinence and nausea)</td>
<td>4 (4)</td>
</tr>
<tr>
<td>Multiple treatments involved (multimorbidity or polypharmacy)</td>
<td>6 (6)</td>
</tr>
</tbody>
</table>

COPD, chronic obstructive pulmonary disease; PPI, proton pump inhibitor

<sup>a</sup> Number of times not reported or not applicable: 68 out of 174.
Table 3
Characteristics of the pharmacists participating in the observations and interviews (n = 6).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female gender, no. (%)</td>
<td>4 (66%)</td>
</tr>
<tr>
<td>Clinical experience, years, range</td>
<td>2–20</td>
</tr>
<tr>
<td>Clinical pharmacy post-graduate degree, no. (%)</td>
<td>2 (33%)</td>
</tr>
</tbody>
</table>

Table 4
Examples of drug-related questions that the pharmacists received during the observations.

<table>
<thead>
<tr>
<th>Topic of question</th>
<th>Asked by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dosage of an antidiabetic drug and its relation to muscle cramps and abdominal</td>
<td>GP</td>
</tr>
<tr>
<td>pain as potential side effects in an individual patient</td>
<td></td>
</tr>
<tr>
<td>Differences between various brands of injectable drugs</td>
<td>Nurse</td>
</tr>
<tr>
<td>Alternative treatment for a drug that is not tolerated by an individual patient</td>
<td>GP</td>
</tr>
<tr>
<td>Differences between allopurinol and febuxostat as treatment options in gout</td>
<td>GP</td>
</tr>
<tr>
<td>A licence to prescribe a compound drug containing papaverine</td>
<td>GP</td>
</tr>
<tr>
<td>Equivalent dosage or product to compensate for specific drug shortages</td>
<td>GP</td>
</tr>
<tr>
<td>Interaction between apixaban and herbal medicinal products and vitamins</td>
<td>Nurse</td>
</tr>
</tbody>
</table>

GP, general practitioner
Table 5
Strategies to ensure the trustworthiness and rigour of the research process [26] employed in this study.

<table>
<thead>
<tr>
<th>Credibility</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adoption of appropriate and established research methods [12]</td>
<td></td>
</tr>
<tr>
<td>• Sampling of all pharmacists as participants (Sampling and recruitment)</td>
<td></td>
</tr>
<tr>
<td>• Triangulation of findings through different data collection methods (Data collection)</td>
<td></td>
</tr>
<tr>
<td>• Use of different researchers to independently analyse data (Data analysis)</td>
<td></td>
</tr>
<tr>
<td>• Familiarity with the study context among the researchers (Research team and trustworthiness)</td>
<td></td>
</tr>
<tr>
<td>• Description of researchers’ background and training (Research team and trustworthiness)</td>
<td></td>
</tr>
<tr>
<td>• Member checking by participating pharmacists (Research team and trustworthiness)</td>
<td></td>
</tr>
<tr>
<td>• Examination of previous research to frame findings (Discussion)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transferability</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Description of the context (Study design and Setting) and comprehensive description of the findings (Results)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dependability</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Comprehensive methodological description to enable the study to be repeated (Methods)</td>
<td></td>
</tr>
<tr>
<td>• Reflective appraisal of the study (Discussion)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Confirmability</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Description of the researchers’ ontological and epistemological position (Study design)</td>
<td></td>
</tr>
<tr>
<td>• Recognition of limitations in the study methods and their potential effects (Discussion)</td>
<td></td>
</tr>
<tr>
<td>• Audit trail of the recruitment, data generation and analysis (Data collection and Data analysis)</td>
<td></td>
</tr>
</tbody>
</table>

Figures
Figure 1

Five themes, each with 1 to 6 categories, concerning what pharmacists do in general practice. Findings from the participant observation (*) have been integrated in the themes that emerged from the semi-structured interviews.

Covid-19, coronavirus disease 2019; EHR, electronic health record; GP, general practitioner; HCP, healthcare professional; MDD, multidose drug dispensing
Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Observationprotocolandinterviewguide230524.pdf