



Original article

Evaluation and pharmacists perspective of repeat prescribing process in refill clinics

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ABSTRACT

Introduction: Repeat prescription refers to a re-prescribed medications list issued by a refill clinic, commonly for stable chronic illnesses. The issues regarding repeat prescriptions have garnered increasing importance in recent years, as no general agreement about a standardized protocol exists between organizations. Due to the importance of pharmacists' involvement and intervention in the process of repeat prescription and the lack of local studies discussing this topic, the aim of this study was to assess pharmacists' perspectives toward the repeat prescription process and identify the issues related to repeat prescriptions in refill clinics at tertiary hospitals.

Methodology: A self-developed questionnaire was used to assess outpatient pharmacists' perspectives toward the repeat prescription process. This was followed by a comprehensive review of the electronic health records (EHR) of patients who requested repeat prescriptions to identify related issues. The study was conducted at a tertiary teaching hospital from September 2019 to January 2020.

Results: Based on the questionnaire, 34 pharmacists reported receiving less than 10 repeat prescriptions per week (82.35%); nevertheless, around 88.24% of pharmacists have faced issues with the repeat prescription process, and only 15.65% of the issues got resolved. Most of the pharmacists (88.24%) showed a proactive attitude toward modifying the work process to reduce issues. Further, the review of the patients' EHR identified 1766 prescriptions with related issues in 617 (14.02%) patients' profiles. Most of these issues were seen in the elderly (46.7%). The most common issue encountered was "Patients came too early to request," which accounted for 986 (55.8%) of the total issues, followed by the issue of "Refilling a restricted medication" reported at 247 (14%). Only 11% of these issues were completely resolved by pharmacists.

Conclusion: The repeat prescription service might be associated with issues that lead to preventable adverse effects, especially among the elderly who are prone to such effects. Comprehensive reviews of patients' profiles are necessary to assess their needs and avoid such issues.

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1. Introduction

One of the priorities for patient safety around the world is to reduce the preventable harm of repeat medication prescriptions. Repeat prescription refers to a re-prescribed medications list

issued by a refill clinic, commonly for stable chronic illnesses, which is used by patients to cover their long-term needs before their next regular follow-up visit (Price et al., 2017). It is a complex activity that accounts for 75% of the general practice prescriptions, mandating effective communication and collaboration between clinicians, pharmacists, and patients to ensure therapeutic drug safety and efficacy (MPO, 2013). If there is any negligence pertaining to the content of repeat prescriptions, it can put the patient at risk of harm and possible clinical admission and further care. To avoid medication safety issues concerning repeat prescription, establishing a protocol to standardize the refill process will protect the patient and maximize the safety and efficacy of the treatment (Price et al., 2017).

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Although repeat prescription is a service that aims to improve patient care by ensuring easy access to medication, providing better patient compliance, minimizing drug abuse, and reducing the burden on specialized clinics, several studies have identified many drug-related issues in repeat prescriptions, resulting in a major healthcare burden, and it was estimated that around 57% of patients receiving repeat prescriptions had at least one drug-related problem (DRP) or medication change (Saastamoinen et al., 2009). DRPs include dispensing the wrong medication or an incorrect dose (Helmons et al., 2012), duplicating medication of the same drug class or by brand and generic name, refilling a discontinued medication (Pattin et al., 2018), non-adherence, and overdosing (Saastamoinen et al., 2009, Alzuman and Al-Humaidan, 2017). These issues significantly affect patients' health outcomes, satisfaction, and expenditures as well as physicians' workload and time (Nguyen and Zare, 2015).

Building an effective management of the repeat prescription process remains a challenge, and several factors have contributed to the occurrence of issues while handling repeat prescriptions (Pattin et al., 2018). These issues include poor documentation of the changes in therapeutic plans, automatically reproduced prescriptions, dependence on patient request, and ignorance of the medical notes. Additionally, a lack of standardized medication synchronization between the patients' refill appointments and follow-up visits or laboratory tests was reported (Pattin et al., 2018). The desynchronization was thought to be due to different types of requests for renewal—some physicians prefer to renew prescriptions electronically or by telephone, while others allow the pharmacist to handle the renewal requests. Moreover, the lack of an organized approach toward the management of repeat prescriptions has been identified; thus, several studies were conducted to develop methods to ensure accuracy and efficiency of the renewal process system, and it has been shown that involving pharmacists in the decision-making process is an important step to reduce the error rate and cost of repeat prescriptions and increase patient satisfaction (Ferrell et al., 2006, Witry and Doucette, 2014).

The incorporation of pharmacists has demonstrated their benefits in many interventions, such as reviewing and managing drug-related issues, delivering the best medication management plan, and improving health and economic outcomes (Witry and Doucette, 2014). Both patients and healthcare providers benefit from the easy accessibility and approachability of pharmacists in refill clinics to discuss drug therapy. Their involvement in reviewing the patient's medical record and refill history, ensuring the safe consumption of medication, and enquiring about the patient's side effects, if any, has maximized patient safety and prevented further complications (Granàs and Bates, 1999, Riege, 2005).

The issues with repeat prescriptions have garnered increasing importance in recent years, as no general agreement about a standardized protocol exists between organizations. Due to the importance of pharmacists' involvement and intervention in the process of repeat prescription and the lack of local studies on this topic, this study aimed to assess pharmacists' perspectives toward the repeat prescription process and identify all the related issues in refill clinics at tertiary hospitals with a future vision to implement a refill clinic model where pharmacists and physicians work together to improve patient care.

2. Method

A cross-sectional and descriptive study was conducted to evaluate all repeat prescriptions processed by refill clinics at King Saud University Medical City (KSUMC) in Riyadh from September 2019 to January 2020. KSUMC includes King Khalid University Hospital (KKUH) and King Abdulaziz University Hospital (KAUH). Refill clinics

are clinics that provide patients the opportunity to get refills on their medications through repeat prescriptions, especially for patients whose medications run out before their next appointment. The KSUMC refill clinics were established in 2010. Their daily working hours are from 8:00 a.m. to 2:00 p.m., Sunday to Thursday, and an average of 90 patients visit the everyday. Two refill clinics are open daily and usually run by two primary care physicians. For each patient coming for a refill, the physicians are supposed to carry out a comprehensive review of the patient's profile to assess the necessary medications and send the refill prescription to the outpatient pharmacy. The outpatient pharmacists then verify the patient's medication records to assess the appropriateness of the prescribed medications and dispense the refilled medications. Only outpatient pharmacists and repeat prescriptions written by primary care physicians for refill clinics were included in this study. Ethical approval from the KSUMC Research Ethics Committee was obtained (No. E-19-4084) to conduct the study.

2.1. Data collection

The main aims of the present study were to evaluate the repeat prescription process and identify the related issues. Accordingly, a self-developed questionnaire targeting outpatient pharmacists was used to assess the pharmacists' perspectives toward the repeat prescription process. Further, a comprehensive review of the electronic health records (EHR) of patients who requested repeat prescriptions as well as the report documentation log sheet used by refill clinics or outpatient pharmacists dispensing medications was performed.

2.2. Repeat prescription questionnaire

A questionnaire composed of 16 items was extracted and developed after an extensive review of the literature for concepts related to assessing outpatient pharmacists' knowledge and attitudes regarding repeat prescriptions and investigating the presence of any related issues. The participating pharmacists were asked to fill out either a paper survey or an online survey that was hosted on Google Forms, the link to which was sent via e-mail. The questionnaire consisted of the following three sections: (1) pharmacists' location, department, and career position; (2) patterns of repeat prescriptions in terms of the average number, patient behavior, and presence and type of issues; and (3) pharmacists' perspectives and reactions toward the repeat prescription process and its associated issues. Each eligible participant was asked to complete an informed consent form before proceeding to complete the anonymous survey.

2.3. Outpatient pharmacy log sheet and EHR

The data was collected every Sunday and Wednesday, since these days are the busiest with greater patient load in the refill clinics, from September 2019 to January 2020. The issues related to repeat prescriptions were classified into 13 categories and formulated in a list based on the questionnaire responses and the issues mentioned in the literature. Only repeat prescriptions written by primary care physicians covering refill clinics were included in the present study, and the list was used to classify issues while reviewing the patients' EHR. Due to the anticipated poor documentation of issues regarding repeat prescriptions by outpatient pharmacists, the data was collected using two steps. First, outpatient pharmacists were asked to fill a designated log sheet to document any issue while dispensing repeat prescriptions; the log sheet included the file number, repeat prescription date, medication name, the list of repeat prescription issues and a comment section. Second, these sheets were collected by the research team on a

weekly basis to review the medical records using EHR and thereby confirm the issue of reported repeat prescriptions and fill in the remaining or missing data. The collected information from EHR included age, gender, refilled medications, date of the repeat prescription, last date the medication was refilled, duration of refill, quantity of medication dispensed, types of issues identified with repeat prescriptions, and types of action carried out by pharmacists to resolve related issues.

2.4. Statistical analysis

A descriptive analysis using Statistical Package for Social Sciences (SPSS) was performed, and the results were expressed as percentages and frequencies. Content validity was used to test the face and content validity of the survey. The survey was pilot tested among a small sample of senior outpatient pharmacists ($n = 7$) to evaluate the questions for the relevance, content, clarity, and ease of understanding. The group was asked to comment independently on the relevance of the survey in order to calculate the content validity index (CVI) of the items. The relevance of the items was assessed using a four-point Likert scale with the following values: (1) not relevant, (2) somewhat relevant, (3) relevant, and (4) very relevant. The acceptable lower limit for the CVI value is recommended to be 0.8 (ref). The CVI of the survey was found to be >0.8 (Polit and Beck, 2004). Based on the group's observations and comments, the questionnaire was modified in some domains and more issues were added to the list. Each item of the questionnaire was linked to the objectives of this study, thereby indicating content and face validity. The internal consistency or reliability of the items was also estimated using Cronbach's alpha coefficient and found to be satisfactory (>0.7) (Cronbach, 1951).

3. Results

3.1. Pharmacists' perspectives toward the repeat prescription process

34 of the 40 pharmacists provided their responses to the questionnaire on repeat prescriptions (with an 85% response rate), based on which, it was determined that pharmacists usually receive more than 10 repeat prescriptions per week (82.35%) for 43.18% of patients who come to the pharmacy after their medications supply has finished and not at the time of refill (18.18%). Around 88.24% pharmacists faced issues with repeat prescription, and the most common issue was refilling stopped medications (14.11%). The same issue happened 3–5 times per week in 41.18% of cases. To avoid the issues associated with repeat prescription, around 31% and 28.17% of pharmacists review the patients' records and current/past medication history respectively, and most of them (42.86%) call the prescriber to resolve particular issues; however, only 15.65% of all issues so far were resolved. The majority of the pharmacists (88.24%) showed a proactive attitude toward modifying the work process to reduce issues. The pharmacists' perspective toward the repeat prescription process are detailed in Table 1.

In addition to the types of issues listed in the questionnaire, the participating pharmacists mentioned other issues that were integrated into Table 2 for EHR reviewing to confirm the issue of reported repeat prescription. These issues included "dose changed for the first time by the refill clinic," "refilling medications NOT documented in patients file," "patients came too early to request," and "refilling controlled medication."

The pharmacists were questioned if "they were given the opportunity to improve the system of repeat dispensing, what would you do?" and their recommendations were as follows:

- For any repeat prescription, a text message should be sent to the patient days or a week ahead of time for the medication to be picked up at a specific day/time, which will provide pharmacists some time to resolve issues before physical patient contact.
- Make "medication reconciliation" a mandatory task with each visit for the refill clinic for the prescriber and pharmacist.
- Provide awareness/educational sessions about the issues seen with repeat prescription for prescribers.
- Create and alarm system to stop duplication and to notify if there are any prescriptions that were not dispensed last time.
- Enhance regular communication between physicians and pharmacists about the availability of medications, privilege of prescribing restricted medications, and process of prescribing or refilling controlled medications.
- Fix the electronic prescription to prohibit the prescriber from canceling and deleting the dispensed medication from system and rewriting it while the patient has enough stock at home.

When the pharmacists were asked to provide some suggestions aiming to improve or limit the issues of the repeat prescription process, the following suggestions were mentioned:

- Run quality improvement projects to find the weakness points and resolve them.
- Encourage pharmacy staff to report any patient safety issues related to his/her repeat prescribed medications.
- Develop a clear guideline for the repeat prescription process by a multidisciplinary team with emphasis on the fact that the prescription should come from the in-charge physician of each refill clinic.

3.2. Issues related to the repeat prescription process:

The types and definitions of the issues associated with the repeat prescription process that were incorporated from the survey and literature review are listed in Table 2. Of approximately 4400 repeat prescription requests processed by the refill clinics on Sundays and Wednesdays during the study period, 1766 prescriptions with related issues were detected in 617 (14.02%) patients' profiles. The issues were commonly identified among the elderly aged ≥ 60 years ($n = 288$ out of 617; 46.7%) and female gender ($n = 338$ out of 617; 54.78%). Of the 1766 identified issues, the top five therapeutic classes were antihypertensive drugs ($n = 281$; 16%), blood glucose-lowering drugs ($n = 259$; 14.6%), lipid modifying drugs ($n = 150$; 8.5%), anti-epileptics ($n = 143$; 8%), and anti-thrombotic drugs ($n = 131$; 7.5%).

3.3. Types of issues identified with repeat prescriptions

The most common issue encountered was "Patients came too early to request," which accounted for 986 (55.8%) of total issues, followed by "Refilling a restricted medication" reported at 247 (14%). Further issues were identified such as medication duplication, refilling a stopped medication, and changing the dose while refilling (Table 3).

Despite refill clinics providing medications and the necessary refills at least until the next scheduled visit, many patients tend to come too early to request for new prescriptions, regardless of whether they have enough supplies or not. About 986 such prescriptions were identified; 12.27% were renewed despite patients coming early by ≥ 3 months, 37.72% were renewed despite coming early by ≥ 2 month, and 11.05% were renewed despite coming early by ≤ 1 month. Additionally, about 38.95% of prescriptions were renewed despite the availability of active refills on previous prescriptions which patients claimed out of supply.

Table 1
Pharmacists' perspective towards repeat prescription process.

Sections with its questions	Frequency	Percentage %
Pharmacist location, department, and career position:		
Profession:		
Pharmacist	33	97.06
Clinical pharmacist	1	2.94
Pharmacy department:		
Outpatient	30	88.23
Out-&In-patient	4	11.77
Institution:		
KKUH	26	76.47
KAUH	8	23.53
Patterns of repeating prescription in terms of average number, behavior of patients, presence of issues		
Average number of repeat prescriptions received by pharmacy per week:		
Once a day	0	0
2–4 times a day	2	5.88
5–7 times a day	4	11.76
8–10 time a day	0	0
More than 10 a day	28	82.35
When do patients come to request repeat prescription?		
At the time of refill	8	18.18
Before one month	15	34.09
After the medication supply has finished	19	43.18
While dispensing repeat prescriptions, have you encountered any issues?		
Yes	30	88.23
No	4	2.94
Type of issues usually encountered:		
Therapeutic duplication	19	11.66
Dose changed but prescribed the old	22	13.5
Refilling a stopped medication	23	14.11
Running out of medications early	18	11.4
Accidentally missed refilling	17	10.43
Frequency changed	7	4.29
Formulation changed	2	1.23
Route changed	2	1.23
Switched medications	10	6.13
Refilling all medications regardless of needs	22	13.5
Refilling restricted medication	15	9.2
I have not encountered any issues	1	0.61
Others	5	3.07
Pharmacists perspective and reaction towards the repeat prescription process and its associated issues		
How often do you face the same issue per week while dispensing repeat Rx?		
None	0	0
1–2 times per week	5	14.71
3–5 times per week	14	41.18
7–10 times per week	8	23.53
More than 10 times per week	7	20.59
As a pharmacist, have you ever had to ask the prescriber to clarify an order before filling repeat Rx?		
Yes	32	94.12
No	2	5.88
Before filling repeat prescriptions, you usually:		
Review patient's record	22	30.99
Perform medication reconciliation	16	22.54
Review lab results	8	11.27
Review current/past medication history	20	28.17
None	3	4.23
Others	2	2.82
What type of action you usually do resolve issues with repeat Rx?		
Fill out a report	7	11.11
Call the prescriber	27	42.86
Discuss with another pharmacist or HCP	16	25.4
Write an intervention in patient file	12	19.05
Do nothing	0	0
Others	1	1.54
When issues are encountered, do the pharmacy\refill clinic make any changes to avoid similar issues in the future?		
Yes	8	23.53
No	26	76.47
Did issues get resolved?		
No issues get resolved	0	0
Only 20%	6	18.75
Only 30%	5	15.63
Only 50%	8	25
Only 70%	8	25
All issues get resolved	5	15.63

(continued on next page)

Table 1 (continued)

Sections with its questions	Frequency	Percentage %
As a pharmacist, you try to modify the work process to reduce issues.		
Yes	30	88.24
No	0	0
Neither	4	11.76
If you were given the opportunity to improve the system of repeat dispensing, what would you do?	Opinions for these open-ended questions mentioned in the result section	
Can you provide suggestions aiming to improve or limit the issues of repeat prescription process?		

Renewal and continuation of a medication that was previously discontinued was also a frequent issue as 105 (5.9%) such prescriptions were identified. The majority of these prescriptions (n = 64;

Table 2
Types of issues and definition.

Issue no	Type of issue	Definition
1	Therapeutic duplication	
2	Dose recently changed but still refilling the <u>old</u> dose	When the dose of medication was recently changed during regular follow up visit but was refilled with the older dose instead. (Issue could be due to the system having the older orders viewed which could lead to mix up OR when physicians do not review previous notes to check for updates)
3	Refilling a stopped medication	<ul style="list-style-type: none"> ■ Considered stopped if stated by the patient during dispensing Rx in out-patient pharmacy. OR ■ When a medication that was not dispensed for 2 years or more. (Should not be refilled if patient's medication information is not updated, as it could lead to issues like drug interaction, duplication, etc)
4	Dose changed for the first time by the refill clinic	Dose changed during refill into a never been used dose. "This action is against the hospital's policy" since the physicians are not familiar with the patient's full history.(Issue could be due to physicians thinking they could intervene since they have the authority to do so in their usual FU clinics)
5	Frequency changed	
6	Formulation changed	
7	Route changed	
8	Switched medications	
9	Refilling all medications regardless of patient needs	When patients are out of a certain medication but was refilled with all their current/active medications regardless if they were out of supply in all of them or not. Refill clinics usually refill without checking/asking patients about their needs and they end up having more supply than what they asked for.
10	Refilling restricted medications for specialized clinics	According to the restricted medications list
11	Refilling medications NOT documented in patients file	Refilling a medication that has NO documentation on previous use and has never been prescribed/dispensed through KKHU. "This action is against the hospital's policy" (Refill clinics are not allowed to do so as mentioned in the policy since physicians don't have full background on patient's history)
12	Patients came too early to request	When patients come to the refill clinic despite having enough supply for ALL current meds (usually 1 or 2 months early)
13	Refilling controlled medication	

Table 3
Types of issues associated with repeat prescriptions (n = 1766).

Type of issue	Frequency	Percentage (%)
Therapeutic duplication	28	1.6
Dose recently changed but still refilling the <u>old</u> dose	10	0.6
Refilling a stopped medication	105	5.9
Dose changed for the first time by the refill clinic	67	3.8
Frequency changed	16	0.9
Formulation changed	15	0.8
Route changed	2	0.1
Switched medications	7	0.4
Refilling all medications regardless of patient needs	140	7.9
Refilling restricted medications for specialized clinics	247	14
Refilling medications NOT documented in patients file	123	7
Patients came too early to request	986	55.8
Refilling controlled medication	20	1.1

60.9%) were renewed for medications that had been stopped for three years or more. Around 35 (33.33%) and 6 (5.71%) of discontinued prescriptions were renewed for medications that has been stopped for ≥ 2 years and < 2 years, respectively.

3.4. Types of actions taken to resolve issues

While reviewing the pharmacists' role in identifying and taking action on each issue category, it was found that only 11% of the issues were completely resolved by them. The most frequent action observed was "Order not dispensed but remains active in the system," which was reported for 7.9%, followed by "Order held on file," which accounted for 2.8% of the total actions done (Table 4).

Data showed that under the most frequent issue "Patients came too early to request," a total of 947 (96%) were undetected and dispensed as they were with no changes, whereas only 4% were resolved by pharmacist, either by holding the prescription order on file or by not dispensing the medication. As for the second issue "Refilling a restricted medication," around 19% were detected and managed in ways such as holding the prescription order on file or dispensing the medication in a limited amount (Table 5).

Table 4
Types of action done by pharmacists.

Type of action	Frequency	Percentage (%)
Order dispensed as it is with no change	1572*	89*
Order NOT dispensed (but remain active on patient's profile)	140	7.9
Order held on file	50	2.8
Only dispensed limited amount	3	0.2
Order was fixed	1	0.1

* Approximately 947 (60.24%) were from the issue "patients came too early to request".

4. Discussion

Repeat prescription medications account for a high percentage of the drug dispensing practice. This study’s findings revealed that pharmacists usually receive more than 10 repeat prescriptions per week (82.35%), and the issues related to repeat prescription were commonly identified among the elderly (46.7%). Similarly, in the UK, about 75% of the overall prescribed medications and 77% of prescriptions issued by general practitioners are repeat prescriptions, and patients over 65 years constitute 75% of the beneficiaries (Swinglehurst et al., 2011, Watt et al., 2012, Petty et al., 2014, Grosset et al., 2017). Moreover, in Netherlands, the repeat prescriptions medications account for up to 75% of prescribed medications, while it accounts for only 44% in Finland (Davidson et al., 1997, Saastamoinen et al., 2008). However, about 19% of repeatedly prescribed medications in Finland were prescribed without consultation, and the elderly comprised 29% of the consumers of these medications. Additionally, approximately 61.5% of repeat prescriptions are issued by Norwegian general practitioners without physical consultation (Rokstad and Straand, 1997). Such practices might expose patients for preventable harmful effects, especially the elderly who are prone to adverse effects as a result of their physiological changes, associated comorbidities, and the common practice of polypharmacy (Lavan and Gallagher, 2016). Despite the face-to-face contact between the physician and patient in the refill clinics, this study found 1766 repeat prescriptions with issues, which are most likely due to the overlooking or absence of a comprehensive review of the patients’ profile and lack of assessment of the patients’ needs.

During a 16-year surveillance study (from 1990 to 2016), the mortality rate secondary to adverse effects was found to be 2.8% of all deaths in the United States (Sunshine et al., 2019). Inappropriate repeat prescriptions may contribute to such dilemmas due to the associated issues. It may lead to drug safety issues in terms of overdosing/prescribing or underdosing/prescribing of medications, continuation of stopped drugs or discontinuation of essential drugs, or loss of follow-up for particular or restricted medications (De Smet and Dautzenberg, 2004). Of all the requests for repeat prescriptions in this study, the refill of restricted medications, refill of medication not documented in the patient’s profile, change of medication dose during refill, and therapeutic duplication accounted for 14%, 7%, 3.8%, and 1.6%, respectively. Renewal and

continuation of a medication that was previously discontinued was noticed in 5.9% of the repeat prescriptions. The majority of these prescriptions (60.9%) were renewed for medications that had been stopped for three years or more. Although cost reduction is one of essential aims of the repeat prescription process, inappropriate repeat prescriptions may lead to unfavorable economic issues by spending money on medication unneeded by patients (De Smet and Dautzenberg, 2004). Our study found that 55.8% of patients had their refills ahead of time, and about 7.8% of patients had their medications refilled regardless of their needs.

Another important finding was that only 11% of issues related to repeat prescriptions were completely resolved by pharmacists. These findings raise intriguing questions regarding the nature and extent of pharmacist overload in outpatient pharmacies. In addition, the pharmacist must review the medical notes to reconciliation, which is time-consuming and increases the waiting period for patients in the outpatient pharmacy (Granås and Bates, 1999). This combination of findings provides some support for the conceptual premise about the importance of the involvement of pharmacists in refill clinics (Zermansky et al., 2001). A pharmacist’s experience in detecting, resolving, and preventing medication errors and any DRPs will play a vital role in the optimizing process to allocate medicine resources, reduce cost, and limit inappropriate prescription. Reducing inappropriately prescribed medications not only contributes to saving the drug cost but also reduces the risk and burden of adverse drug events (Zermansky et al., 2001, Dalton and Byrne, 2017). The involvement of community pharmacists in the process of repeat prescription review before physicians signing it off has helped to prevent some DRPs and reduce the absolute risk of DRP by 26% (Granås and Bates, 1999). Moreover, the involvement of pharmacists in the repeat prescription process, compared to the usual practice, led to less repeat medications (mean: 0.2 ± 1.4 vs. 0.4 ± 1.53; 95% CI, -0.4 to -0.1) and, in turn, saving £62 in the repeat medications cost and £54 overall for each patient per year (Zermansky et al., 2001).

The participating pharmacists’ recommendations and suggestions toward improving the repeat prescription process and limiting the issues were focused on the following: (1) ensuring patient safety through “medication reconciliation” and technical implication to alarm duplication and prevent new prescriptions, (2) gaining patients’ satisfaction by improving communication between different healthcare providers about the repeat prescription

Table 5
Type of action done on each repeat prescription related issue.

Type of issue	Actions done by pharmacists to resolve repeat prescription issues					
	Order dispense as it is with no change	Order NOT dispensed	Order held on file	Only dispensed limited amount	Order was fixed	Total
Therapeutic duplication	5	17	6	0	0	28
Dose recently changed but still refilling the old dose	8	0	1	0	1	10
Refilling a stopped medication	81	18	6	0	0	105
Dose changed for the first time by the refill clinic	61	4	2	0	0	67
Frequency changed	13	2	1	0	0	16
Formulation changed	13	2	0	0	0	15
Route changed	2	0	0	0	0	2
Switched medications	4	1	2	0	0	7
Refilling all medications regardless of patient needs	112	24	4	0	0	140
Refilling restricted medications for specialized clinics	202	32	11	2	0	247
Refilling medications NOT documented in patients file	108	12	3	0	0	123
Patients came too early to request	947	24	14	1	0	986
Refilling controlled medication	16	4	0	0	0	20
Total	1572	140	50	3	1	1766

process and by adapting the system to notify patients to pick their medications at a specific time, and (3) developing clear guidelines for the repeat prescription process by a multidisciplinary team. Several guidelines developed by multidisciplinary teams have been initiated in the UK since 2004 with aims to ensure patient safety, increase the patient's and clinician's satisfaction, and reduce the cost (NPC, 2004, GMC, 2013, GMC, 2021). Walsall Clinical Commissioning Group set their own guideline for their residents where a pharmacist-led repeat prescription service was initiated (NICE, 2014). This was approved when the pharmacists' involvement showed better use of medications, decrease in drug wastages, increase in adherence, and saving in associated costs. Similarly, in a model that was implemented by a primary care center to manage refill clinics, the renew requests were distributed between the physician and clinical pharmacist who dedicated two hours each day to review both the pharmacy medication record as well as the EHR for laboratory monitoring and checking patients' medication adherence and follow-up visits with physicians. The benefits of this collaborative care were the ability of the clinical pharmacist to decrease the physicians' workload by 60%, improve the request-processing time, increase patient safety, and increase patient and provider satisfaction (GMC, 2021).

Our study is limited by its nature of being descriptive to inability to investigate the sequela of DRP. Also, the patients' characteristics for which issues with repeat prescriptions were found are lacking. However, the aim of our study is only to evaluate the repeat prescription process and identify the related issues. Our findings may recommend to improve the process of repeat prescription, to establish a multidisciplinary model, and to provide the path to conduct researches investigating the patient negative outcomes associated with inappropriate repeat prescription.

5. Conclusion

The repeat prescription service is aimed to ensure patient safety, improve the patient's and clinician's satisfaction, and reduce costs. However, it is associated with issues that may lead to preventable adverse effects, especially among the elderly. Moreover, these issues can negatively impact the patient clinically and the healthcare system financially. Applying a comprehensive review of the patients' profile and addressing the lack of assessment of patients' needs is necessary to avoid issues related to repeat prescription. Additionally, a multidisciplinary model of the repeat prescription process with the pharmacists' involvement would enhance the achievement of safe and cost-effective usage of repeat medications.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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