

Allocation and prioritization of hospital pharmacist clinical services in British Columbia

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Abstract

Background: Clinical pharmacists are a limited resource in British Columbia (BC). Few studies have been conducted to explore hospital clinical pharmacist allocation. It is unclear how pharmacy leaders prioritize the allocation of their pharmacist staff to provide clinical services at their sites.

Objectives: To characterize how hospital pharmacy leaders allocate their pharmacists within their sites.

Methods: This qualitative study used key informant interviews of hospital pharmacy leaders in BC, Canada. Seven questions were included in the interview guide, asking participants about their philosophy for organizing clinical pharmacist coverage, exploring the adequacy of current staff levels, asking about barriers and enablers, and looking at the use of quality assurance mechanisms.

Results: Sixteen participants were interviewed. The data yielded five themes: clinical staff allocation, barriers to providing optimal pharmacy services, clinical work prioritization, staff training and recruitment, and quality assurance.

Conclusions: Pharmacy leaders in BC consider a variety of factors in allocating their clinical staff. While funding is an important factor in human resource allocation, even with adequate funding, there is a lack of adequately trained staff to fill available positions. Future exploration is needed to determine the best method of pharmacist allocation in relation to patient outcomes and to identify novel ways to support training of clinical pharmacists.

Keywords: pharmacy practice, qualitative research, clinical pharmacy

Introduction

Pharmacists have been shown to improve medication-related outcomes for patients across several practice settings,¹ and with this proven benefit has come an increased demand for their services. In general, however, pharmacists are a limited resource. For example, recent Canadian data revealed that, on average, there is only 1 inpatient budgeted hour per acute patient day.² This shortage has resulted in a strain on hospital pharmacy departments and a struggle by operational leaders to determine how best to allocate their staff to meet the demands of the many different units and services within the hospital.³

Pharmacy leaders are accountable for the appropriate and effective use of human resources, which includes ensuring that clinical pharmacy services are delivered to the patients most in need. With scarce resources, pharmacy leaders must prioritize which services, programs and wards will receive clinical pharmacy services. Individual pharmacists deployed into the hospital must then efficiently prioritize which patients in their areas should receive care and the nature of that care. This prioritization is a continuous and dynamic process. Researchers have investigated ways to guide hospital pharmacist human resource allocation at the levels of both individual pharmacists and pharmacy departments.³⁻⁷ Conducting a scoping review to identify studies that developed tools to prioritize which patients should have their medication therapy assessed by a pharmacist, Botelho et al. found that, while a number of different tools had been created, there were limitations in both the development and validation processes.⁸ Many of the tools lack standardization and external validation in practice areas outside of where they are implemented.⁵ Other criticisms address the tools' lack of sensitivity and difficulty implementing them into everyday practice,⁵ along with a mismatch between existing patient-to-pharmacist ratios and the time required to complete expected clinical tasks.⁷

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The process that pharmacy leaders currently utilize to prioritize the allocation of hospital pharmacists at different hospital sites in British Columbia (BC) remains unclear. The purpose of this study is to characterize how hospital pharmacy leaders in BC allocate pharmacists to provide clinical pharmacy services within their sites.

Methods

Study Design

This was a qualitative study using key informant interviews of hospital pharmacy leaders across the Canadian province of BC. The consolidated criteria for reporting qualitative research (COREQ) were used as a reporting guide for the study.⁹

An initial literature search was conducted for the purpose of developing the interview questions. As there is a lack of research in this area, however, the study investigators developed and refined the questions used in the interview guide. Pilot testing was not done, as the study team included members who would fall within the targeted population. The interview guide contained a total of seven questions, asking participants about their philosophy for organizing clinical pharmacist coverage, exploring the adequacy of their current staffing levels, and determining whether they utilized quality assurance mechanisms and what barriers and enablers they had encountered to achieving optimal staffing levels.

Participant Recruitment

An email invitation was sent out via the BC hospital pharmacy directors. Participants who identified as hospital-based pharmacists working in BC and with responsibilities for clinical pharmacy service deployment were invited to contact the principal investigator (PI). The PI then confirmed their eligibility, collected the signed consent form, and organized a time for the interview to take place via Zoom. A link to a baseline demographic survey was sent to participants, and they were asked to complete it prior to their interview. At the end of the interview, participants were also asked to pass on the study information to any of their colleagues who they thought would meet the inclusion criteria and who would be interested in participating. A consecutive sampling strategy was used to target a sample of 15–20 hospital pharmacist leaders. Harmonized ethics approval was obtained from the University of British Columbia's Behavioral Research Ethics Board, with operational approval individually obtained from each of the respective health authorities in the province.

Research Team and Reflexivity

The study investigators (SS, SG, ML) are in leadership positions within their respective hospital health authorities. The investigator (KD) who conducted the interviews did know some of the participants prior to their enrolment in the study, but the personal opinions and beliefs of the researchers were not shared with participants before or during the study. The background of the investigators within hospital pharmacy

could have introduced bias in terms of their motivation to conduct the study.

Data Collection and Analysis

Interviews were transcribed using the transcription function within Microsoft Word Online. Transcriptions were then reviewed by the investigator who conducted the interviews (KD) to ensure authenticity; transcripts were not returned to participants for review before analysis. The transcripts were coded independently by two of the investigators (KD, LL) using Nvivo. The two met regularly to discuss the data coding both with each other and with the other research team members. Any conflicts in coding were resolved through discussion. After the initial review of the coding, the two investigators used a reflexive thematic analysis approach that allowed for the development of themes as they proceeded through the coding process. The initial themes were then discussed with the full research group and refined to yield the final themes presented in this manuscript.

Results

Sixteen participants were interviewed, all by one investigator (KD) between Oct 2022 and Mar 2023. The interviews, on average, lasted 26.1 minutes (standard deviation 7.3 mins; range 16.7 – 41.8 minutes). All participants were clinical pharmacist coordinators or pharmacists in other formal leadership roles (Table 1). The number of full-time equivalents varied considerably amongst the participants, with resulting variation in the number of clinical pharmacists that work at each site Monday to Friday (mean 10.9; standard deviation 8.3). Qualitative analysis of the data yielded five themes: clinical staff allocation, barriers to providing optimal pharmacy services, clinical work prioritization, staff training and recruitment, and quality assurance. Data saturation was felt to be achieved with the 16 interviews conducted.

Clinical staff allocation

Pharmacy leaders reported that they felt accountable for appropriately and effectively allocating clinical pharmacy services to high-priority patients, and that they often consider a wide range of factors when determining staff allocation. Most participants mentioned patient acuity or complexity as a major consideration. Critical care or acute care areas were given priority due to the complex nature of the patient population.

"[Patient] acuity actually is probably a big factor...we never don't cover the acute wards." – Participant 4

Funding for clinical pharmacy services was also another important consideration. Participants reported giving priority to hospital units or programs that had provided dedicated funding to pharmacy to provide clinical pharmacy services.

"We make sure that we always provide services to areas that do fund us, which is specifically funding for a pharmacist." – Participant 6

A few participants, however, also discussed how dedicated funding can also become challenging to manage.

"What gets a little complicated is some little politics point of view. If someone gives us money, we would need to be nice and cover and have a pharmacist." – Participant 2

Areas that pharmacy leaders considered as having the most "bang for your buck" were also prioritized. For example, clinical areas that had ample opportunities for pharmacist to intervene or prevent downstream problems were assigned priority. Four participants identified the emergency department as being an area with high yield.

"So we've prioritized emergency, saying you know, if we can solve some problems on the intake, then you can get things sorted out before they get distributed across the hospital." – Participant 7

Two participants specifically discussed aligning their clinical services with provincial priorities.

"One thing which influences our decision-making step [is] ministry priorities.... For example, mental health is a big issue now, which is why we have a [pharmacist] in mental health, a pharmacist in opioid stewardship. So I think a lot of the provincial health priorities — [such as] mental health, addictions, not able to find a GP and a primary care pharmacist — influence how we redistribute resources as well." – Participant 11

Other less commonly considered factors were pharmacists' interests and teaching opportunities.

Barriers to providing adequate pharmacy services

All participants acknowledged that they were unable to provide their ideal level of clinical pharmacy services to their hospitals. Participants were asked about their ideal level; responses varied depending on the type of site and the clinical setting. The most frequently mentioned barrier was insufficient funding to hire the number of clinical pharmacists needed to service the entire hospital. Participants expressed frustration at the difficulty in obtaining resources to expand clinical pharmacy services.

"The biggest barrier is funding. Working from a health authority that does not provide much funding, it's very tricky to pull money from for new services. And for old services, if it's old units, you're not going to get money anymore." – Participant 1

Participants described acquiring trained staff as another big challenge. Some reported securing funding for a clinical pharmacist, but being unable to find appropriate candidates to staff the position because of difficulties in recruiting or retaining staff.

"We have had some positions just go [unfilled]. We would post it as a clinical grade 2 position [with] any new funding and sometimes it would go unfilled." – Participant 9

Participants also discussed the challenges of contending with new job opportunities in other areas that are perceived to have better work-life balance (e.g., primary care, medication use evaluation, and informatics). These new positions have drawn many residency-trained pharmacists away from inpatient clinical roles.

"A lot of pharmacists are moving to like the PC [Primary Care] network, like that is a Monday to Friday 8 to 4. Or moving to a formulary coordinator position, something [they] can work from home or more like regional like where [they] can do more project work. That's been taking away a lot of pharmacists as well." – Participant 2

Other challenges include balancing the demands of the dispensary to ensure that it is adequately staffed to meet operational needs. Participants indicated that, depending on their pharmacy structure, staff shortages in the dispensary would lead to trained pharmacists being reallocated away from clinical duties.

"At the end of the day, those pharmacists that are part of the rotation come under the operations budget, and if we end up having a bunch of people sick or on summer vacation, inevitably, we have less people on the ward and they get pulled to the dispensary" – Participant 12

Clinical work prioritization

Participants reported that their clinical pharmacists find it challenging to provide comprehensive care to all of their patients, especially in settings where the patient-to-pharmacist ratio is high. Strategies to address these challenges varied across different sites. Some pharmacy departments provide written instructions to guide staff on how to triage patients or to highlight mandatory tasks, while others leave it entirely up to individual pharmacists' discretion.

"There's some targeted things there that people will look at as well, again, as a core part of their day, but after that, they have a lot of freedom, to be honest, for them to hand-pick patients that they feel that would be worthy of a little bit extra focus to do a full pharmaceutical review." – Participant 12

Staff training and recruitment

Pharmacy leaders have implemented various strategies to address the shortage of residency-trained pharmacists. These strategies have varied depending on the underlying reason for the shortage. Some sites had difficulty recruiting or retaining trained staff because of their location, the size of their residency programs, or their limited capacity to train. To address these issues, many pharmacy leaders have advocated for expanding the residency program or providing mentorship programs to non-residency trained pharmacists.

“We’ve been pretty strategic in the last 5–6 years to developing kind of in-house training [for grade 1 pharmacist]. You know, mentoring programs and trying to build up clinical skills by being paired up with a, you know, experienced pharmacist.” – Participant 3

Two participants highlighted the importance of inspiring learners or students to pursue residency training, showcasing the work of clinical pharmacists in hopes of recruiting these learners in the future.

“We’re pretty strong around trying to create student experiences, and we recognize that that is a very pretty significant way we actually recruit — people being exposed to the system and drawing them in from that exposure.” – Participant 3

In particular, one participant raised the concern of inequity in distribution of trained staff within the health authority, resulting in some hospital sites being more short-staffed than others, and suggested that this needs to be addressed at a regional level.

“We say we’re one region, but we don’t move staff around to where the need is to try and equalize level of service.” – Participant 7

Quality assurance

Quality assurance (QA) programs measure the quality and quantity of pharmacist interventions. Very few pharmacy leaders had a system in place at the time of the interviews, but most are actively planning to implement one, or expressed interest in doing so.

“[Quality assurance] is actually something I very much care about coming into this role.. I have identified that this hasn’t been done in prior years because the lack of leadership...so this is one of my priority items as I move forward in this role.” – Participant 3

Some participants felt that QA measures created additional workload for their pharmacists and that there was overall a lack of staff engagement. Others were unsure what data to collect or felt that metrics were not reflective of pharmacists’

contributions. A common issue raised among participants was the lack of an effective tool or platform for pharmacists to efficiently capture their interventions.

“We used to have a DTP tracker that’s kind of fallen by the wayside. There wasn’t great uptake or consistent uptake, so [it] didn’t really provide reliable information.” – Participant 14

Discussion

Overall, we found that pharmacy leaders in BC faced multiple challenges to providing their ideal level of clinical pharmacy services at their sites. Their methods of allocating their clinical staff varied, and they described different strategies for overcoming their challenges. Identifying a “one size fits all” solution for staffing shortages and insufficient funding may not be possible due to regional disparities in resources and differences in existing baseline pharmacy service models.

Participants reported that their clinical staff allocation was most often targeted towards higher acuity settings such as the intensive care unit. This is not surprising, given the long-established benefit of clinical pharmacists in this specialized setting.¹⁰ However, recent recognition of the benefits of pharmacist use at the start of a patient’s journey through the hospital does raise the question of the best overall use of staff when they are a limited resource.¹³ An unanswered question is whether there is value in strategically positioning pharmacists in more resource-limited clinical areas, where prescribers aren’t as readily available.

Participants also reported a lack of transparency in the different funding models in different institutions, expressed a need to learn more about how to best advocate for funding, and described frustration at the difficulty in securing funding for pharmacy staff.

Publicly funded access to hospital services is a federally legislated requirement across Canada.¹¹ BC residents access hospital services funded by the provincial Ministry of Health, and these services are implemented by regional health authorities.¹² Funding is allocated to regional health authorities using a Population-Needs-Based Funding model that accounts for population demographics, utilization, inter-regional flows, and regional costs.¹² Hospital pharmacy-specific funding is included as part of each hospital’s operating budget, and many factors can influence this funding, including hospital activity, medication utilization, available clinical programs and services, targeted funding initiatives, and teaching requirements.² With the development of performance-based pharmacy payment models in the US,¹⁴ different funding models for community pharmacy are now being explored, but it is unclear if these models would be suitable within the institutional setting.

Participants also described the lack of qualified applicants as a barrier in providing ideal care. Within the province, clinical pharmacy positions currently require pharmacists to complete a pharmacy practice residency after they are licensed, and various organizations have set out a vision that all pharmacists involved in direct patient care will complete a postgraduate residency prior to entering into practice.¹⁵ In BC there are currently more than 60 Year 1 pharmacy residency positions, but despite this number, the programs are not meeting the current human resource demands.¹⁶ And while additional credentialing opportunities exist, such as certification with the Board of Pharmacy Specialties, there is no standardized recognition of these credentials as a way to increase capacity for training.

Participants described efforts to create in-house training programs for non-residency-trained pharmacists to address this gap, but expressed concern over these programs, as additional resources are still needed to provide this training, and its quality and depth still falls short of residency training.

Concurrent with advocating for additional pharmacist funding, staffing, and training, there are opportunities for Canadian hospital pharmacy departments to ensure that regulated pharmacy technicians are working to full scope.² This can result in significantly reducing pharmacist time spent on drug distribution activities — recently reported at 36% — to free more time for providing clinical services.^{2,17} Unfortunately, shortages of regulated pharmacy technicians across Canada remain a barrier to implementing this approach.²

One Canadian approach to QA has been the development of clinical pharmacy key performance indicators (cpKPI), a means for hospital systems to undertake a quantitative assessment of an organization's overall identified priorities.¹⁸ The goal of collecting and reporting cpKPI data in clinical pharmacy is to improve the quality of patient care, promote evidence-based practice, elevate professional accountability and transparency, and set a benchmark of minimum standards within the organization.¹⁸ cpKPIs prioritize the different activities that pharmacists should be undertaking within their day.¹⁸ The majority of study participants indicated that, for a variety of reasons, they do not collect data on QA measures. Many expressed hope that future automation would allow for more seamless collection of cpKPI data.

The study had several limitations. The research was conducted in Canada in one province, and may not be generalizable to other health systems. The BC health authority system of pharmacy services is not, however, significantly different from that of other Canadian jurisdictions. A small number of clinical pharmacy leaders volunteered to participate, and they may not fully represent the perspectives and opinions of all pharmacy leaders in the province. Despite this, the participants provided insights from many perspectives,

inclusive of both urban and rural hospitals and of small, medium and large hospitals.

Findings from this study can be applied within and beyond BC hospitals. Pharmacy leaders who allocate pharmacists to provide clinical services should develop organizational policies that guide decisions about clinical staff allocation. They can use these policies to drive standardization of decisions to deploy pharmacists to priority care areas and to enhance transparency amongst staff and other invested partners as to why and how these decisions are made. These policies can also ensure that decision-making regarding pharmacist allocation is equitable, value-add, and aligned with organizational priorities.

Unsurprisingly, insufficient funding for pharmacists remains a material barrier to providing adequate clinical pharmacy services. Leaders should ensure that all pharmacy resources are being utilized in the most efficient manner possible. That means ensuring that all pharmacy professionals are working to their full scope of practice. Pharmacy leaders can also partner with clinical operations leadership to ensure that organizational priorities drive funding of team-based care in hospitals. This includes adequate funding of all pharmacy-related care to ensure that patient medication therapy needs are met. In addition, pharmacy leaders should strategically increase the pool of qualified pharmacist positions through partnerships with existing Accredited Pharmacy Residency programs and create or expand in-house training programs.

Pharmacists deployed to areas with more patients than they can care for in a period of time should be guided by clinical practice standards that set expectations about how to efficiently and effectively prioritize patients for pharmaceutical care. Pragmatically, a standard approach can be driven by factors such as the risk for drug therapy problems associated with impacts to morbidity and mortality, and the possibility of high resource utilization through events such as hospital readmission.

To ensure that pharmacy leaders and staff can identify opportunities to improve clinical care quality, a quality management system that monitors key indicators of pharmacist performance should be implemented. Key indicators should be tracked prospectively, embedded into existing digital health information systems, and reported regularly to leaders and staff in a highly visible manner, and improvement targets should be identified by consensus among leaders and staff.

In conclusion, pharmacy leaders in BC described how they allocate their clinical staff and assist them in prioritizing clinical services. These leaders identified many barriers to providing optimal levels of clinical services. Development of standardized methods of clinical prioritization could help

guide pharmacists in providing their services, and tools for easily collecting data on quality assurance measures could help them improve patient care and better utilize available funding.

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