


The Impact of the COVID-19 Pandemic on the Transplant Pharmacist Workforce

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Abstract

Background: The COVID-19 pandemic has placed an unprecedented strain on the US healthcare system, greatly impacting transplant centers. **Objective:** The purpose of this survey was to evaluate the impact of the COVID-19 pandemic on the transplant pharmacist workforce. **Methods:** A survey was disseminated electronically to assess the impact of the COVID-19 pandemic on the transplant pharmacist workforce. Respondents were asked to give background regarding transplant center, patient, population, and departmental staffing. **Results:** There were 67 total respondents from 56 transplant centers. In response to the COVID-19 pandemic, 55% of centers reported stopping non-life saving transplants, and a majority (89%) stopped living donor transplants altogether. The banning of caregivers on-site during education, reduction of bedside education teaching, and cancelling of group teaching classes occurred at 46%, 40%, and 22% of centers, respectively. Consequently, 42% of pharmacists surveyed felt that their confidence in patient and caregiver's understanding of medications had decreased since these changes have been implemented. **Conclusions:** Pharmacist perception of patient and caregiver understanding of transplant medications has decreased since before the COVID-19 pandemic. As health systems strategize resource allocation throughout the pandemic, the importance of patient education must be prioritized to sustain and improve transplant outcomes.

Keywords

transplant, pharmacist, COVID-19, education

Introduction

In 2004, the bylaws for the United Network for Organ Sharing (UNOS) were amended to recognize and include transplant pharmacists as integral members of the transplant multidisciplinary team.¹ Not long after these amendments were published, the Centers for Medicare and Medicaid Services (CMS) Conditions of Participation for Transplant Centers required the presence of a designated, qualified expert in transplant pharmacology.² These key inclusions, in addition to recent guidelines on the provision of transplant pharmacy services, has allowed the expansion of the number, scope, and impact of transplant pharmacists on the field of transplantation.³ Currently, transplant pharmacists provide a multitude of services across all phases of transplant care, from pre-transplant evaluations and medication reviews, peri-operative management of immunosuppressive and prophylactic medications, patient and caregiver education, as well as immunosuppression and disease state management in the ambulatory post-transplant setting.⁴

Since the emergence of the novel coronavirus, SARS-CoV-2, in 2019 and its expansion to the United States (US), the COVID-19 pandemic has placed an unprecedented strain on the US healthcare system, greatly impacting transplant centers. With

healthcare resources spread thin, rationing of intensive care unit (ICU) beds, risk of transmission to potential living donors, and risk of transmission to recipients, there was immense potential for the reduction of transplant activity not just in the US, but worldwide. In the throes of the pandemic, many hospital departments, including pharmacy departments, were forced to make difficult decisions; changing priorities during this time led to potentially reducing transplant pharmacist services, changing allocation of pharmacist full time equivalents (FTEs) away from the transplant center to other hospital/medical departments, and even eliminating FTEs. Despite this, according to recent UNOS/OPTN data, transplant numbers have largely remained

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unaffected across the U.S.⁵ The purpose of this survey was to evaluate the impact of the COVID-19 pandemic on the transplant pharmacist workforce.

Study Method

Following approval from the Executive Board of the respective committees, survey dissemination occurred electronically via an email hyperlink to the complete list of AST Transplant Pharmacy Community of Practice (TxPharm COP) and American College of Clinical Pharmacy (ACCP) Immunology/Transplant Practice Research Network (PRN). Participation requests were sent on two occasions over 4 weeks (August 2020 to September 2020). The survey was built using REDCap (Research Electronic Data Capture) software. Respondents were asked to give background about their transplant institution, patient population and departmental staffing. Additionally, respondents were asked to comment on how the COVID-19 pandemic has impacted their ability to perform their transplant related activities for patient care. A likert scale was used to assess pharmacists' perception of resources pre- and during the COVID-19 pandemic. Listserv responses came from multiple nations, but due to heterogeneity of healthcare systems, only respondents from the United States were included.

Survey participation was voluntary. Statistical analysis was performed using R studios. Differences in survey response were analyzed using Student's t-test, Mann-Whitney *U* test, chi-square test, or Fisher's exact test, as appropriate. This study was approved by the Stanford University Institutional Review Board.

Results

There were 67 total respondents from 56 transplant centers. The majority of pharmacists surveyed practice primarily in abdominal transplant with adult patients, as shown in Table 1. The number of transplants at the respective centers was fairly heterogeneous; roughly 60% of centers were either small volume (<100), or large volume (>400). Almost all centers had a living donor kidney transplant program (97%). In response to the COVID-19 pandemic, 55% of centers reported stopping non-life saving transplants, and a majority (89%) stopped living donor transplants altogether.

A majority of the pharmacists surveyed were .9 to 1.0 FTE (85%), exempt/salaried (82%), and funded by the pharmacy cost center (73%). The mean number of transplant pharmacist FTEs was 3.8, but ranged from 1.9 to 6.0 across centers. Respondents were representative of all parts of the United States (Figure 1).

Table 2 summarizes the state of the patient care services and workplace of the transplant pharmacists surveyed at their respective centers prior to and in the midst of the COVID-19 pandemic. Of the 67 pharmacists surveyed, 65 of them (97%) performed one-on-one counseling sessions with patients prior to

Table 1. Transplant Center Description.

Center Characteristic (n, %)	Frequency (n=67)
Practice area	
Abdominal	41 (61.2)
Thoracic	10 (14.9)
Both	16 (23.9)
Patient population	
Adult	50 (74.6)
Pediatric	5 (7.5)
Both	12 (17.9)
Number of organ transplants (n= 57)	
<100	17 (29.8)
100-300	19 (33.3)
>300	21 (36.8)
Living donor program (n= 57)	
Kidney	55 (96.5)
Liver	28 (49.1)
Both	28 (49.1)
None	2 (3)
In response to the COVID-19 pandemic, my transplant center:	
Stopped performing non-life saving transplants at any point	
Yes	37 (55.2)
No	30 (44.8)
Stopped performing living donor transplants	
Yes	60 (89.6)
No	7 (10.4)

the COVID-19 pandemic. The banning of caregivers on-site during education, reduction of bedside education teaching, and cancelling of group teaching classes occurred at 46%, 40%, and 22% of centers, respectively. This was likely due to changes in hospital policies to minimize the risk of COVID-19 transmission. Consequently, 42% of pharmacists surveyed felt that their confidence in patient and caregiver's understanding of medications had decreased since these changes have been implemented. When asked to compare how the pharmacist felt about their time and resources pre-COVID compared to the height of the pandemic, respondents reported less perceived time and resources to carry out daily activities, based on a Likert scale.

In addition to changes in the medication education and inpatient transplant pharmacist services, numerous changes to outpatient transplant pharmacist services were reported. Only a small percentage (5%) of pharmacists that responded halted all outpatient activities. For those that continued outpatient services, 48% transitioned to seeing patients on an as-needed basis, and 40% transitioned to telehealth or phone visits.

Given the changes in workflow and needs during the COVID-19 pandemic, many pharmacists reported having to work in alternative settings; 18% reported having to work in different clinical settings (e.g. intensive care unit, internal medicine), and 12% reported working in operational settings.

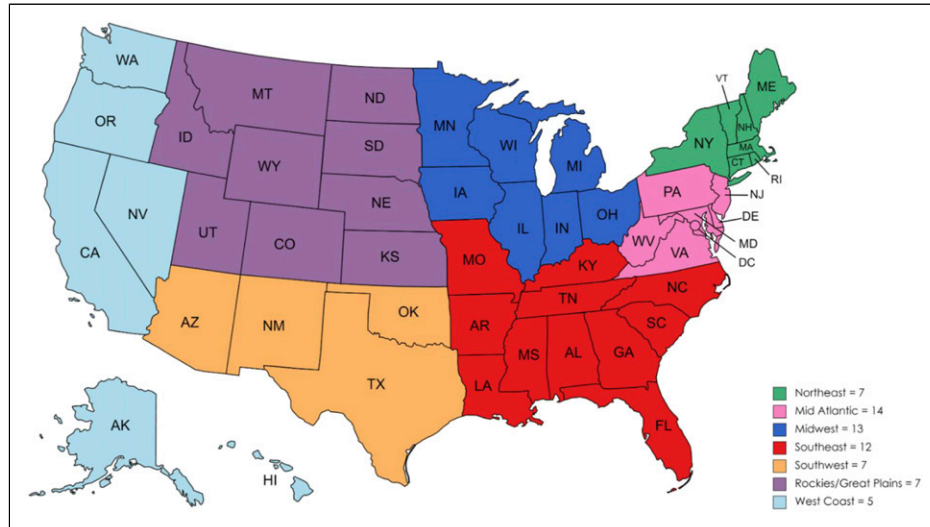


Figure 1. Geographical location of Respondent’s transplant center.

Table 2. Resources and Education practices (n = 67).

Center Characteristic (n, %)	Frequency (n=67)
Prior to COVID-19, how did you perform transplant medication education?	
Individual teaching sessions with patients and caregivers	65 (97)
Group teaching sessions with patients and caregivers	11 (16.4)
Pre-recorded teaching sessions with follow up	4 (6)
In response to the COVID-19 pandemic, my program made the following changes:	
Cancelled group teaching	15 (22.4)
Caregivers no longer allowed on site for education	31 (46.3)
Inability to provide in-person education at the bedside (virtual education only)	27 (40.3)
Bedside pillbox fills no longer performed	11 (16.4)
No changes have been made	20 (29.9)
In response to the COVID-19 pandemic, my program made the following changes to transplant pharmacists’ ability to see patients in the outpatient setting:	
Pharmacists no longer see patients in the outpatient setting	3 (4.5)
Pharmacists only see patients on an as needed basis in the outpatient setting	32 (47.8)
Pharmacists only conduct telehealth or phone call visits	27 (40.3)
No change	25 (37.3)
Not applicable; I do not work in the outpatient setting	4 (6)
Please indicate how you feel about the amount of time/resources available to you and what is required for your daily work responsibilities (0-10)? Mean (IQR)	
Before COVID-19 pandemic	6.9 (6-8)
After CVOID-19 pandemic	5.8 (4-7)
Since implementation of post-transplant medication education changes, my confidence in patient and caregiver’s level of understanding their medications has:	
Decreased	28 (41.8)
Not changed	36 (53.7)
Unknown	3 (4.5)

Of those under the cost center of pharmacy for all or part of their center’s FTE, 18/54 (33%) reported being assigned new work in settings outside of transplant, compared to 0/13 (0%) under transplant or academic cost centers (P=.014).

Of those surveyed; 52% reported hiring freezes at their institutions, 36% reported reduced compensation (furlough, benefit cuts, etc.), 18% reported an unspecified reduction in FTE, 6% reported need for additional overtime, and 25%

reported no change in their work requirements and compensation.

Discussion

Deceased donor organ transplant has seen steady growth over the past 5 years, with a 35% increase over this time period reported by UNOS. Despite a period of decline, and even halting of transplant across U.S. centers in response to the COVID-19 pandemic, transplant volume reported in 2020 was comparable to 2019, with 39,035 transplants performed in 2020 and 39,719 in 2019, respectively.⁵ Despite many transplant centers resuming activities such as living donor transplant and volumes returning to rates seen in 2019, many transplant services were forced to scale back, as reported in the data described by this report. One of the many essential disciplines involved in the care of organ transplant recipients that experienced changes due to the pandemic was transplant pharmacy.

Roughly 30% of transplant pharmacist respondents of the study survey experienced were asked to work in non-transplant clinical practice and operational settings, potentially detracting from dedicated time to transplant patients and their caregivers. With transplant numbers returning to pre-COVID volumes, many of these service changes have not completely reverted to pre-pandemic norms. Hiring freezes, reported by 52%, as well as a reduction of hours (18%) and compensation (36%) of respondent centers, further highlight that the transplant pharmacist workforce is attempting to do the same, if not more with potentially fewer resources. Pharmacists under pharmacy cost-centers were additionally stretched to cover new areas, potentially taking away from needed transplant patient care. Approximately 40% of pharmacists reported transitioning to telehealth or phone visits and complete adoptions of such practice changes require extra time, effort and training. The challenges posed by the COVID-19 pandemic, specifically with regard to the shutdown of international drug factories and limited ability to import medications, crippled worldwide drug supply. This, in addition to the use of certain medications utilized significantly in the transplant recipients (such as azithromycin in lung transplant recipients), led to significant drug shortages across the pandemic. As a result, all pharmacists, especially transplant pharmacists were tasked with helping patients and providers navigate insurance challenges and access to medications.⁶ To state simply, transplant pharmacists in the current workforce feel that the resources they have to perform daily and essential tasks has decreased due to the pandemic, yet transplants are still being performed at, if not exceeding pre-COVID-19 transplant rates.

One of the cornerstones of transplant pharmacy practice, and arguably among the most valuable, is patient education. A single-center study by Taber et al⁷ identified that two-thirds of kidney transplant recipients within the study center experienced a medication error, which led to hospitalization

in 1 of every 8 recipient. At the same center, it has been demonstrated that the patients with medication errors or other medication-related problems were at significantly higher risk for acute rejection, 30-day readmission, and graft loss.⁸ Medication related problems significantly increase a patient's risk of medication non-adherence, which is associated with earlier and more frequent graft loss in kidney transplant recipients.⁹ Pharmacists are in a unique position to mitigate medication problems and improve medication adherence through extensive medication education and involvement in the discharge and transitions of care process.^{10,11} As demonstrated in this study survey, this essential transplant pharmacist function has been severely limited during the COVID-19 pandemic. One of the most important factors that changed was the involvement of caregivers. According to the study survey, caregivers were no longer able to be present for transplant medication discharge teaching at 46% of respondents' centers. This, along with the reduction of group teaching classes by 22% and elimination of pill box fills reported by 16% of respondents, respectively, has forced transplant pharmacists to adapt their workflow. Fan et al describe how they adapted their medication education process including the addition of visual tools and virtual education following orthotopic heart transplantation during the COVID-19 era.¹² The adoption of telehealth became a necessity for healthcare organizations during the COVID-19 pandemic. Various platforms were utilized by practitioners for rendering telehealth services including Zoom, Doximity, Cisco Webex, MyChart etc. The Office for Civil Rights (OCR) issued a Notification of Enforcement Discretion regarding COVID-19 and remote telehealth communications that waived penalties for violations of Health Insurance Portability and Accountability Act (HIPAA) Privacy, Security, and Breach Notification Rules that occur in good faith provision of telehealth during the COVID-19 pandemic.¹³ Given these changes, many pharmacists required more time to coordinate with patient caregivers and perform modified, oftentimes virtual teaching sessions. Consequently, 42% of respondents felt that patient understanding of their life-saving transplant medications had decreased since before the pandemic. To further compound this disparity, 48% and 40% of respondents had to reduce clinic services, reducing clinic visits strictly to an as-needed basis or converting to telehealth visits, respectively. Almost 5% of respondents had to eliminate transplant pharmacist clinic services altogether. Medication education reinforcement with patients and caregivers is an important and often necessary function of outpatient transplant pharmacists. These reductions and changes may further impact patients' understanding of critical medications, and limits caregiver involvement in the process.

There are limitations to this survey that should be noted. Although there were 67 participants representing 56 number of centers, this contains a sample of 21.9% of all transplant centers identified within Scientific Registry of

Transplant Recipient database. Additionally, the volume of transplants performed at respondent's respective transplant centers was fairly heterogenous. This represents a small portion of all ACCP IMTR PRN and AST TxPharm COP members reached; 548 AST TxPharm COP members and 378 ACCP IMTR PRN members, with overlap of membership between listservs, which can limit the generalizability of these results. There is some potential selection bias given that those who feel more strongly about these issues were more likely to respond to the survey, as well as the limitation of the amount of information that is able to be requested from respondents.

Conclusion

The COVID-19 pandemic has posed unprecedented challenges across all areas of the U.S. healthcare systems. As many service lines have had to adapt to new challenges and take on new patient responsibilities, transplant volumes have remained steady. Despite the obstacles faced by transplant pharmacists, the expectation to deliver high level patient care, while supporting the needs of the healthcare system remained. As health systems strategize resource allocation throughout the pandemic, the importance of patient education must be prioritized to sustain and improve transplant outcomes.

Author Contributions

All authors equally contributed to the concept/design of this study, data collection, analysis, and interpretation, drafting of the article, as well as critical revision and approval of the article.

Declaration of Conflicting Interests

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