ASSESSING PHARMACISTS' ACCEPTANCE OF PRESCRIPTION DISPENSING DATA INFOGRAPHIC TO INITIATE PHARMACIST-PRESCRIBER COLLABORATION AND IMPROVE PATIENT OUTCOMES

by

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Submitted to the Graduate Faculty of

the Multidisciplinary MPH Program

Graduate School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Public Health

University of Pittsburgh

2018

UNIVERSITY OF PITTSBURGH

Graduate School of Public Health

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ABSTRACT

Chronic diseases are the most common, costly, and preventable health problems in the United States. Pharmacist-prescriber collaboration has been shown to enhance patient care and improve patient outcomes, especially regarding chronic disease. The purpose of this study is to assess pharmacists' acceptability and perceived usefulness of a Prescription Dispensing Data (PDD) infographic as a tool to facilitate community pharmacist-prescriber collaboration. A PDD infographic highlights aggregate patient care data for mutual patients of a pharmacist-prescriber dyad.

Semi-structured interviews were conducted with community pharmacists across the state of Pennsylvania. A convenience sample of independent community pharmacists were recruited at a state pharmacy association annual conference to participate in the study. Study participants that were members of the Pennsylvania Pharmacists Care Network were targeted for recruitment. A 10- to 20-minute face-to-face interview was conducted with each pharmacist to determine how they could use the PDD infographic to initiate collaborative discussions with prescribers. The Technology Acceptance Model (TAM) guided interview questions, data collection, and analysis. Interviews were audio-recorded and transcribed verbatim. Two independent reviewers coded the transcripts and came to consensus. Relevant codes were grouped into major categories to identify prevalent themes. Members of the research team met to discuss and agree upon themes.

Ten pharmacists who practice at eight independent community pharmacies in Pennsylvania completed the interview. Six themes pertaining to pharmacists' acceptability of the PDD infographic to facilitate pharmacist-prescriber collaboration emerged. 1) PDD infographic is an innovative approach for pharmacist-prescriber collaboration 2) PDD infographic is visually appealing and easy to understand 3) Use of actual patient data may increase community pharmacists' confidence in initiating collaboration with prescribers 4) Prescription dispensing data to create the infographic needs to be easily generated for usability 5) Discussions about quality measures are important to facilitate pharmacist-prescriber collaboration regarding patient care services 6) Using the PDD infographic for pharmacist-prescriber collaboration may improve patient care and health outcomes.

Public Health Significance: The PDD infographic is an innovative approach to initiate pharmacist-prescriber collaborative conversations. Implementing the PDD infographic as part of clinical practice may foster collaboration, team-based care, and improved patient outcomes.

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PREFACE

The author would like to thank the Community Pharmacy Foundation for funding the research study described in this essay. The author would like to acknowledge the Pennsylvania Pharmacists Care Network (PPCN), first and foremost for the difficult and innovative work being done to advance the care people can receive in the communities which they live, and also for providing access to pharmacist participants for this study. Thank you to the Pennsylvania Pharmacists Association for their support of PPCN and this study. The author would like to acknowledge the following individuals from the University of Pittsburgh School of Pharmacy for their contributions and mentorship: Joni C. Carroll, PharmD, BCACP; Olufunmilola K. Abraham, BPharm, PhD; Kim C. Coley, PharmD, FCCP; and Melissa Somma McGivney, PharmD, FCCP, FAPhA.

1.0 INTRODUCTION

Chronic diseases are the most common, costly, and preventable health problems in the United States.[1] Half of the adult population in the United States has one or more chronic disease and approximately one in four adults have two or more chronic diseases.[2, 3] Chronic disease costs the U.S. approximately $1.7 trillion annually, or about sixty cents out of every healthcare dollar.[2] About 80% of all medical treatments involve use of medications and people with chronic conditions account for 91% of all prescriptions filled in the United States.[2, 4] Therefore, improving medication use is crucial to managing chronic disease. Pharmacists' education and training equips them with the necessary skills to deliver preventative care and wellness services, including comprehensive medication management services, to patients with chronic disease.[2] Pharmacists' unmatched accessibility (93% of Americans live within 5 miles of a community pharmacy[5]) makes them an ideal provider of health care to people living in the community with chronic disease. Patients visit their community pharmacy an average 35 times per year[6] compared with visiting their primary care provider 2-3 times per year.[7]

The Center for Disease Control and Prevention, American Public Health Association, and National Governors Association call for the increased role of pharmacists in the provision of direct patient care as members of integrated health care provider teams.[2, 8, 9]

Collaborative Practice Agreements (CPAs) are one solution to developing such team-based relationships, but the national uptake of CPAs has been limited. A significant challenge to

forming CPAs is initiating the collaborative working relationship between the pharmacist and the prescriber. As McDonough and Doucette state in their Staged Approach to Developing the Pharmacist-Physician Collaborative Working Relationship, a CPA represents a late stage in practitioners' working relationship.[10, 11] Literature provides little guidance on how pharmacists can initiate and develop collaborative working relationships with prescribers. The 2017 LINKAGE framework developed by the CDC focusing on the creation of community-clinical linkages between community pharmacists and prescribers calls for pharmacists to identify the unmet health needs of the community they serve and host a collaborative meeting with prescribers to share information and learn of each other's priorities. Yet, the framework does not provide processes on how to approach the initiation of this meeting. The study described in this essay seeks to fill this gap by providing a systematic approach for pharmacists to initiate the collaborative process.

Pharmacists frequently have contact with prescribers in their geographic area within the traditional prescription dispensing process, but often do not have a systematic way of identifying prescribers with whom to collaborate. Pharmacists currently do not have a data-driven way to initiate conversations centered around relationship-building and collaboration.[12] Building relationships with prescribers and capitalizing on existing relationships are key factors in pharmacist-prescriber collaboration.[11] Several studies emphasize that face-to-face meetings between pharmacists and prescribers are integral in establishing trust and building collaboration.[3, 11, 12] Relationships with prescribers are usually built socially first or out of familiarity.[11, 12] Role specification, trustworthiness, and relationship initiation are significant predictors of collaboration between pharmacists and prescribers. Zillich et al. developed a validated tool used to measure pharmacist-prescriber collaboration. Two important elements of

the tool include whether or not the pharmacist: 1) Spent time trying to learn how they can help the prescriber provide better care, and 2) Showed an interest in helping the prescriber improve his or her practice.[13-16] Currently there is no literature detailing how the pharmacist can undertake these two objectives. This study assesses the acceptability of using data readily available to community pharmacists to drive and inform conversations with prescribers about collaboration.

Pharmacy dispensing data has not been previously utilized to initiate collaborative conversations with prescribers. Dispensing data is readily available to pharmacists and rich in information about the population that the pharmacy serves, such as prevalence of chronic conditions, patient characteristics including demographic information and medication-related problems and patterns (adherence, gaps in care, polypharmacy). In addition, there is information about the prescribers whose patients utilize the pharmacy such as: volume of prescribers' patients who utilize a specific pharmacy, commonly prescribed medications specific to prescriber, and disease prevalence within the patient population of a specific prescriber.

A concise way to easily convey this large amount of data is by using an infographic. An infographic is a visual representation of data that allows the viewer to quickly assess trends and comparisons between values while enabling the viewer to think critically about a particular data set in terms of broader patterns and implications.[17] Infographics have been used as a way to communicate information to the public and patients.[18-20] To a lesser extent, infographics have been utilized and studied as a means to communicate information to healthcare professionals.[21, 22] Simple infographics may enhance comprehensibility of study results for clinicians.[23] While commonly used in the public health space[24], infographics have not been widely studied in collaborative efforts between pharmacists and prescribers.

To inform this study, a pilot project by Carroll and colleagues assessed prescribers' feedback on a Prescription Dispensing Data (PDD) Infographic to be used to facilitate pharmacist-prescriber face-to-face meetings.[25] Each PDD infographic used in the project contained data on mutual patients of a top prescriber and one independent community pharmacy. An example of a PDD infographic is depicted in Figure 1. Carroll and colleagues found that prescribers perceived the PDD infographic to be useful when its contents were discussed with the pharmacists in a face-to-face meeting.[25] The in-person discussion was found to be particularly valuable due to the fact that the infographic and its presentation looked and felt different than receiving a traditional quality measure report in the mail, such as from a Managed Care Organization. Prescribers preferred the easy-to-read format of the PDD infographic and desired data on patient therapeutic gaps in care. The result of the pilot project was a finalized PDD infographic template that was used in this study. The finalized PDD infographic template highlights ways in which the community pharmacist can meaningfully collaborate to support patient care (Figure 1).

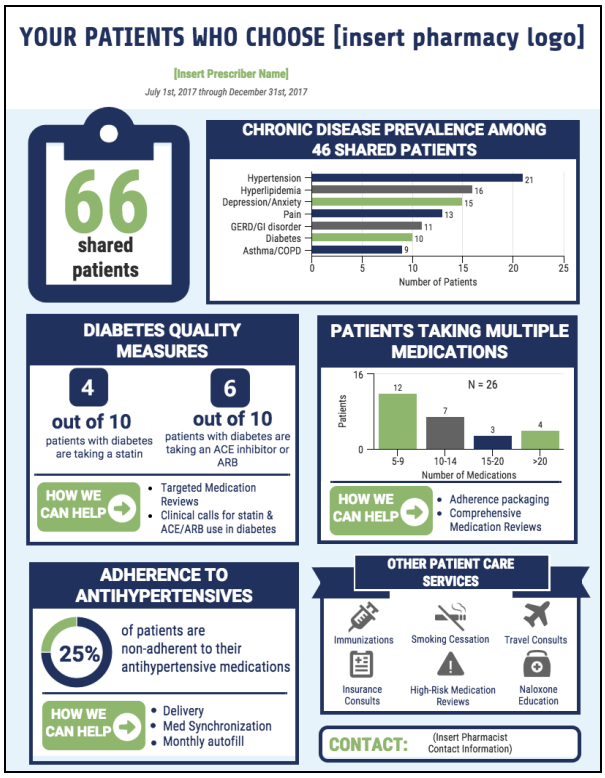

Figure 1. Prescription Dispensing Data (PDD) Infographic

There is limited research of evidence-based and systematic approaches for pharmacists to initiate collaboration with prescribers. The PDD infographic presents data on mutual patients in a visually appealing format to stimulate pharmacist-prescriber collaboration. A PDD infographic highlights aggregate patient care data for mutual patients of a pharmacist-prescriber dyad. Specifically, the PDD infographic includes patient disease states, medication adherence rates, and polypharmacy rates inferred from prescription fill data, as well as pharmacist contact information, and opportunities for pharmacist-provided care. The PDD infographic template highlights quality measures that community pharmacists can meaningfully impact by providing existing patient care services.

The next step was to assess pharmacists' acceptability and perceived usefulness of the PDD infographic, which was the goal of this study.

1.1 OBJECTIVE

The purpose of this study is to assess pharmacists' acceptability and perceived usefulness of a Prescription Dispensing Data (PDD) Infographic as a tool to facilitate community pharmacist-prescriber collaboration.

1.2 METHODS

1.2.1 Qualitative Research Design

The study utilized semi-structured key informant interviews. The Technology Acceptance Model (TAM) guided interview questions, data collection, and analysis (depicted in Figure 2).

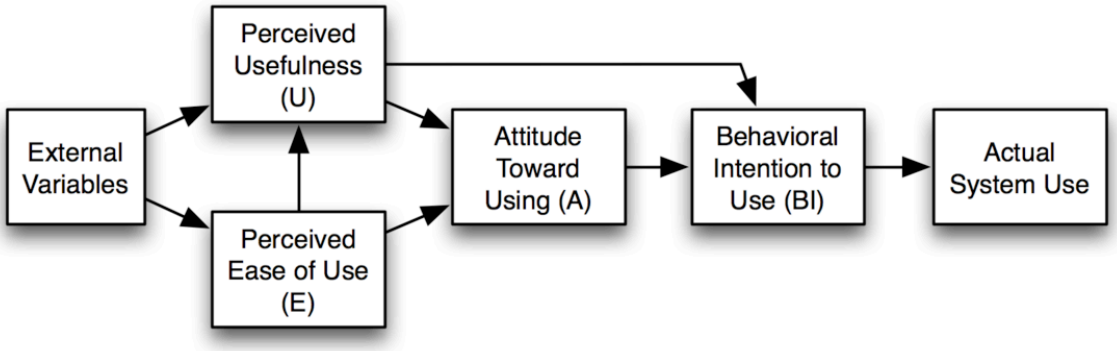

Figure 2. Technology Acceptance Model (TAM)

The semi-structured interview guide was designed to elicit constructs of the TAM, which included perceived ease of use, attitude toward using, usefulness, and behavioral intention to use the PDD infographic. A convenience sample of independent community pharmacists were

recruited at a state pharmacy association annual conference to participate in the study. Study participants that were members of the Pennsylvania Pharmacists Care Network were targeted for recruitment. A 10- to 20-minute face-to-face interview was conducted with each pharmacist to determine how they could use the PDD infographic to initiate collaborative discussions with prescribers.

1.2.2 Data Collection and Analysis

Interviews were audio-recorded and transcribed verbatim. All identifying information was removed during the transcription process. Interviews were analyzed using a generic qualitative approach.[26] A preliminary codebook was developed by the principal investigator after reviewing all the transcripts. Two reviewers independently coded the transcripts using NVivo10® software and met to discuss line-by-line coding decisions. Codes were assigned to phrases and sentences that carried meaning. The codebook was updated throughout the consensus process, as agreed upon by the two reviewers. Any coding discrepancies were resolved through discussion. Relevant codes were grouped into major categories to identify prevalent themes. Members of the research team met to discuss and agree upon themes.

The study was approved as exempt by the University of Pittsburgh Institutional Review Board (IRB).

1.3 RESULTS

Ten pharmacists who practice at eight independent community pharmacies in Pennsylvania were interviewed. Demographics and characteristics of participating pharmacists and their practice settings are summarized in Table 1 and Table 2, respectively.

Table 1. Demographics of Pharmacist Participants

Participant Characteristics	No. (%), n=10
Sex	
Female	4 (40%)
Male	6 (60%)
Age	
<30 years	4 (40%)
30-49 years	6 (60%)
Race	
White, non-Hispanic	10 (100%)
Years of Pharmacy Work Experience	
0-10 years	6 (60%)
11-20 years	2 (20%)
21-30 years	2 (20%)
Conducted any kind of prior meeting with a prescriber	7 (70%)

Table 2. Characteristics of Participants' Pharmacy Practice Settings

Pharmacy Characteristics	No. (%), n = 8
Average daily prescription volume	
Less than 250	3 (37.5%)
250-499	4 (50%)
500-749	0 (0%)
750-999	1 (12.5%)
Average number of technicians staffing daily	
1-2	2 (25%)
3-4	4 (50%)
5-6	1 (12.5%)
>6	1 (12.5%)
Average number of pharmacists staffing daily	
1	3 (37.5%)
1-2	4 (50%)
>2	1 (12.5%)

Six themes pertaining to pharmacists' acceptability of the PDD infographic to facilitate pharmacist-prescriber collaboration emerged. The first two themes were related to the concept and look of the infographic: 1) PDD infographic is an innovative approach for pharmacist-prescriber collaboration and 2) PDD infographic is visually appealing and easy to understand. Themes 3 and 4 dealt with the use of prescription dispensing data: 3) Use of actual patient data may increase community pharmacists' confidence in initiating collaboration with prescribers and 4) Prescription dispensing data to create the PDD infographic needs to be easily generated for usability. The last two themes regarded quality patient care: 5) Discussions about quality measures are important to facilitate pharmacist-prescriber collaboration regarding patient care services and 6) Using the PDD infographic for pharmacist-prescriber collaboration may improve patient care and health outcomes. Pharmacists reported that the PDD infographic is a valuable "conversation starter" that is relevant to both the pharmacist and the prescriber. Pharmacists expressed interest in using this new approach to initiate collaboration with prescribers.

1.3.1 Theme 1: PDD infographic is an innovative approach for pharmacist-prescriber collaboration.

Pharmacists stated that they had never previously used prescription dispensing data in an infographic format to initiate collaboration with prescribers. One pharmacist reported previously using data to facilitate a face-to-face conversation with a prescriber; however, it was stated the data was hard to discern as it was in the format of a "busy, number-heavy report". Pharmacists found the approach of using an infographic to be a unique and desirable way to approach collaborative conversations.

> *"I've never created anything like this or really that similar. Usually it's a little more drawn out, something for them to read later, [like] some brochures or newsletter type stuff. I could see [the infographic] being used way differently than anything I've used before…You might talk and leave it, or you might send it ahead but [this is] good to use it in the conversation." –Pharmacist 9*

> *"I want to help patients and I know my pharmacies [are] already doing adherence and phone calls and we're doing this stuff. I just don't have a good way to communicate that to the prescriber other than just walking in and saying like "hey we do all this great stuff. And if we're doing all this great stuff in my pharmacy for compliance. But if I can show the prescriber I have your patients, this many patients, this many of your patients are using my pharmacy. Here's what we're doing for these patients. I think that's how I would have the conversation." –Pharmacist 10*

> *"I find it interesting. I think that it's very helpful. I could certainly see myself using this." –Pharmacist 6*

The infographic was described to be a useful "conversation starter" that would help break down barriers in approaching prescribers because presenting the infographic would not request anything from the prescriber, but rather simply be a way to present information to the prescriber.

> *"I think that often times providers feel as though we are asking them to kind of like fix everything, do everything. I feel like this is a way to look more collaboration and so basically like I'm presenting this information but here's what I can do together to support this initiative. Because I don't think that a lot of primary care providers are fully aware of all the things that we can be doing to help out as well." –Pharmacist 3*

1.3.2 Theme 2: PDD infographic is visually appealing and easy to understand.

Pharmacists found the infographic to be visually appealing and reported the clear layout allowed them to discern a large amount of data in a short amount of time.

> *"It looks really clear to me. I love the way that it's laid out. I think that it makes it really simple and easy to understand, and it gives me just a quick snapshot. I think the use of the graphics and the charts, I like it. I like the colors. Overall, I love the look and what it tells me in a quick snapshot." –Pharmacist 4*

> *"Infographics are important because they provide you with the high-level quick information." –Pharmacist 3*

> *"It's very catchy and draws you in, something that would certainly be memorable I would think." –Pharmacist 2*

1.3.3 Theme 3: Use of actual patient data may increase community pharmacists' confidence in initiating collaboration with prescribers.

Pharmacists reported that being equipped with data would increase their confidence and feelings of validity when approaching and discussing mutual patients with a prescriber. They felt that the preparation process of gathering and organizing the data would not only boost their own confidence, but that their preparation work would also convey their level of commitment to the prescriber.

> *"Personally, it'd be a confidence thing. Where I just have this extra piece of info or something to divert attention to and just facilitate the conversation. You get off on a tangent talking about this or that and nothing business-related and then you come back and at least you know where to refocus. So to me it would just keep me on point. I would just feel more confident." –Pharmacist 9*

> *"I think it just adds a layer of validity, and I think it kind of boosts credibility…when you're prepared people notice, and if you want convince*

somebody that you're reliable and you're invested and you're committed, showing them that you've done your homework I think it goes a long a way…I think it's an asset. You're not just talking in theory; you're looking at the numbers." –Pharmacist 6

"I think it's good that's there's a lot of data that's specific to the prescriber here so it shows that [you] prepared for your meeting [with] this prescriber and that you have something new to share with them that I think they'd be interested in. … I think it looks great that we've done our homework whenever we go to them to show them this. –Pharmacist 2

It was also acknowledged that other stakeholders in the healthcare field, such as insurance payers have access to and utilize data all the time. It was stated that it makes sense that community pharmacists do the same.

"I think this is an excellent start because especially for community pharmacies who don't know how to approach a physician or have never done it. And realizing what data they actually have, cause you know, reality is our payers have that data and they use it all the time for other aspects and I think it's very good." –Pharmacist 1

1.3.4 Theme 4: Prescription dispensing data to create the PDD infographic needs to be easily generated for usability.

Pharmacists expressed concerns about their capability and the time required to pull the needed data from community pharmacy prescription dispensing systems.

"It's a little labor intensive cause you gotta run the reports and look at that, but I think that [the data is] eye-opening to physicians." –Pharmacist 1

"Well I would if I had a nicer dispensing system I would be totally fine with having a template and developing my own [PDD infographic]. But since my dispensing system is pretty archaic, I would prefer the convenience of something else helping me with that information." –Pharmacist 3

It was recognized that different community pharmacies use different dispensing system softwares and there is a need for capability to pull the needed data reports across all systems for widespread usability.

> *"For me it's feeling confident that I could put this [PDD infographic] together. [If] there's a template I could plug into, that it's very clear. That even across dispensing systems, here's the kind of idea or report that you could run to create this information like this step-by-step of how we would put this together. To me is the biggest barrier for using this." –Pharmacist 4*

1.3.5 Theme 5: Discussions about quality measures are important to facilitate pharmacist-prescriber collaboration regarding patient care services.

Pharmacists stated that including quality measures relevant to the prescriber on the infographic is key. Discussions facilitated by the infographic must center around the prescriber's priorities when it comes to quality performance.

> *"As long were presenting information to them that's relevant to them with respect to their Alternative Payment Models, or what they're being held accountable for as a prescriber." –Pharmacist 6*

> *"[I] want to know what [prescribers] value too. I know sometimes they can pick their own quality measures that they're tracking with MIPS (Merit-based Incentive Payment System), so if they've selected a quality measure that's on here then definitely I'd want to leverage that. Or if they've expressed that they're having difficulty with a measure say they say 'I know I'm not doing so well on statin adherence do you have any ideas on how I could contribute?'. So having that that story prepared of how you could help them with areas they're looking to improve." –Pharmacist 2*

Pharmacists reported that the pharmacist user of the PDD infographic needs to be educated on and capable of discussing quality measures and how pharmacies affect quality measures that rate prescribers.

"Whoever's going to use this [infographic] tool…how educated are they on how physicians get paid?...I think for this to work, whoever's presenting this to the physician, they need to have an understanding [of] how do physicians get paid to feel comfortable to do this." –Pharmacist 1

"[How] I would approach it would be to talk with them a little bit about quality measures and specifically relating how perhaps their HEDIS measures relate a lot to our Star Ratings and the pharmacy. And begin the conversation that way. And say that obviously…we want to provide optimal patient care, but we also are being evaluated on our quality just as they are. And so then I would probably dive deeper into…examples of those specific measures and outline them on the graphic." –Pharmacist 3

1.3.6 Theme 6: Using the PDD infographic for pharmacist-prescriber collaboration may improve patient care and health outcomes.

Pharmacists articulated that the process of using a PDD infographic to initiate collaborative conversations with a prescriber could lead to development of a collaborative working relationship with a prescriber, which would ultimately lead to improved team-based patient care and patient outcomes. Working alongside the prescriber to increase quality performance and close therapeutic gaps in care is fundamentally beneficial to the patient.

"If we're driving towards these metrics then it's to the benefit of the patient and their overall health and their exposure to unnecessary costs hopefully. And a better quality of life. If their diabetes is under control, if they're obtaining statin therapy when it's appropriate and hopefully preventing them from having a cardiovascular event, that matters to a patient." –Pharmacist 6

"The continuity of care [is beneficial]; having the both providers working towards the goal of having the patient's health as their priority and their outcomes. Trying to help the doctor [and] the doctor helping us. Total provider information is what I'm gathering is not out there in various practices." –Pharmacist 5

"Ultimately, the patient wins because these [PDD infographics] are designed to help them." –Pharmacist 6

One pharmacist works in a community pharmacy and works in a physician's office for one half day per week. She explicitly stated why increased communication and team-based care is needed from the patient's perspective:

> *"They [want to] know that their care is being tracked on multiple levels by people that actually talk to one another. Because when I'm in the doctor's office a half day a week just seeing the patients trying to have this conversation…about the specialist appointment they had and they have this expectation that 'Oh, well weren't the notes from the doctor sent over to you?' Maybe they were, maybe they weren't. and half the time they're just sitting in a pile somewhere waiting to be uploaded into the computer system and so I feel like from a patient perspective…they assume that we are talking to each other when really we're not that much." –Pharmacist 3*

1.4 DISCUSSION

Pharmacist-prescriber collaboration has been shown to enhance patient care and improve patient outcomes.[27, 28] Collaboration in health care is defined as health care professionals assuming complementary roles and cooperatively working together, sharing responsibility for problem-solving and making decisions to formulate and carry out plans for patient care.[29] The Center for Disease Control and Prevention (CDC), American Public Health Association, and National Governors Association call for the increased utilization of pharmacists in the provision of direct patient care as members of integrated health care provider teams.[2, 8, 9] Collaboration is becoming increasingly vital as our healthcare system shifts from fee-for-service to value-based and providers are held accountable for patient outcomes.[2, 27, 28]

Several studies emphasize that face-to-face meetings between pharmacists and prescribers are integral in establishing trust and building collaboration.[3, 11, 12] However, literature provides little guidance on how pharmacists can structure these face-to-face meetings

to develop collaborative working relationships with prescribers. The process of using a PDD infographic described in this study seeks to fill this gap by providing a systematic approach for pharmacists to initiate the collaborative process.

Carroll and colleagues found that prescribers found the infographic valuable when its contents were delivered in a face-to-face discussion.[25] This study assessed community pharmacists' acceptability and perceived useful of a PDD infographic in facilitating collaborative conversations with prescribers on mutual patients. Constructs of the Technology Acceptance Model and descriptions of the results that apply to each construct follows:

Perceived Usefulness

With the exception of Carroll and colleagues, infographics have not been studied in the pharmacy space; however, they have been used in other health care arenas such as public health.[24] Pharmacists perceived that the design of the infographic made it a useful tool to facilitate conversation. Pharmacists also reported it would be engaging for the end user, the prescriber, because data presented in an infographic format made it easy to discern a lot of information quickly. Not only did the infographic convey a lot of information in a clear format, but the process of placing prescription dispensing data into an infographic allows pharmacists to give context to the data. The data describes medication-related patterns and therapeutic gaps in care for patients that have already chosen the prescriber for their medical needs and have chosen that particular pharmacy to obtain their chronic medications. Armed with this information, using this tool, can a pharmacist and prescriber come to mutual understanding of a patient population's medication-related needs? The pharmacists in this study surmised that they can.

Perceived Usefulness for Patient

Pharmacists recognized that the end goal of utilizing the PDD infographic to initiate collaborative conversations with prescribers is to ultimately benefit patients. The goal of initially discussing mutual patients with prescribers is to discern different ways to better work together to care for these patients. Part of this work includes working together to close therapeutic gaps in care. Pharmacists in the study felt that breaking down communication barriers using an infographic would help facilitate that work.

External Variables

The biggest external variable reported to affect use of the PDD infographic was quality measures. Quality measures and incentive payment programs place an external pressure on prescribers and pharmacists to meet goals.[30, 31] Quality measures affect patient care priorities of both prescribers and pharmacists, therefore quality measures must be taken into account when looking at how to initiate collaboration between the two providers. Pharmacists discerned that the reporting of quality measures that are important to the prescriber, especially those that affect prescriber reimbursement, would be most useful to the prescriber. Therefore, the PDD infographic should focus on medication-related quality measures that are of priority to the end user, the prescriber.

Perceived Ease of Use

Using prescription dispensing data to initiate collaboration with prescribers is not common practice. The PDD infographic process is unique in that it provides the community pharmacist with a process to initiate discussion with prescribers using data that is readily available in the community pharmacy. Prescription dispensing data is rich with information. Chronic disease states can be deduced based on medications filled; medication adherence,

polypharmacy, and a wealth of quality measures pertaining to a specific patient population can be assessed.[25]

Pharmacists reported that perceived ease of use for preparing the PDD infographic to be fairly good, with most of the process being straightforward and do-able. The biggest concern expressed was about pharmacists' capability and the time required to pull the needed data from community pharmacy prescription dispensing systems. It was acknowledged that data pull capabilities need to be universally present in all computer systems.

Attitude Toward Using and Behavioral Intention to Use

Pharmacists asserted a positive attitude toward using the PDD infographic to facilitate collaborative conversations on mutual patients with a prescriber. All participants stated they would like to use this process within their own pharmacies and intend to use this process in the future.

1.4.1 Limitations

Participants were taken from a convenience sample of pharmacists who are members of the Pennsylvania Pharmacists Care Network and attended a state pharmacy association annual meeting. These pharmacists are intrinsically motivated to initiate and develop collaborative working relationships with prescribers. A small sample (n = 10) from one state limits generalizability of study results. Further research is warranted to determine the acceptability of the PDD infographic across a range of community pharmacists.

1.4.2 Next Steps

The process of using a PDD infographic to initiate collaborative conversations with prescribers is currently being tested in pharmacies of the Pennsylvania Pharmacists Care Network.

1.5 CONCLUSION

The PDD infographic is an innovative approach to initiate pharmacist-prescriber collaborative conversations. Overall, the pharmacists perceived the PDD infographic to be a useful tool to facilitate crucial conversations with prescribers regarding mutual patients. Implementing the PDD infographic as part of clinical practice may foster collaboration, team-based care, and improved patient outcomes.

APPENDIX: KEY INFORMANT INTERVIEW GUIDE

Perceived Ease of Use (PE)

1. What is your initial impression of the infographic?
    a. How clear is the infographic to you in terms of what data it represents?
2. How easy do you think it would be to pull the data from your dispensing system to populate the infographic?

Perceived Usefulness (U)

3. How could the infographic be a useful tool in initiating a collaborative discussion with a prescriber on the care of mutual patients?
    a. Describe how the infographic may be used to facilitate conversation with a prescriber.

    Behavioral intention to use system (BI)

    b. How could YOU see YOURSELF using the infographic when discussing collaborative patient care opportunities with a prescriber?

    Attitude Toward Using (A)

    a. What would you like about using an infographic to facilitate collaborative conversations with a prescriber?

Perceived usefulness for self (PU-SELF)

4. In terms of usefulness, please describe how this infographic can impact your provision of patient care services.
    a. How is the process of using an infographic different or the same from what anything you have done in the past to promote collaboration?
    b. What support or training do you think you would want in order to have a successful initial meeting with a prescriber?

Perceived usefulness for patient (PU-PT)

5. How do you see the process of having a discussion with a prescriber regarding mutual patients as being useful or beneficial to patients?

BIBLIOGRAPHY

1. U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. Chronic Disease Prevention and Health Promotion. Chronic disease overview. 2016 Accessed at https://www.cdc.gov/chronicdisease/overview/, April 25, 2018.

2. U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. Public Health Grand Rounds. How pharmacists can improve our nation's health. Accessed at https://www.cdc.gov/cdcgrandrounds/archives/2014/oct2014.htm, April 25, 2018.

3. Kwint H-F, Bermingham L, Faber A et al. The relationship between the extent of collaboration of general practitioners and pharmacists and the implementation of recommendations arising from medication review. Drugs Aging. 2013;30(2):91-102.

4. McInnis T, Strand L, Webb C. The patient-centered medical home: integrating comprehensive medication management to optimize patient outcomes resource guide. Patient-Centered Primary Care Collaborative. 2012.

5. National Association of Chain Drug Stores. Open for business: pharmacies respond to emergency. RxIMPACT. 2016 Accessed at https://www.nacds.org/pdfs/DSN_RxIMPACT2016.pdf, April 25, 2018.

6. Moose J and Branham A. Pharmacists as influencers of patient adherence. Pharm Times. 2014 Accessed at http://www.pharmacytimes.com/publications/directions-in-pharmacy/2014/august2014/pharmacists-as-influencers-of-patient-adherence-, April 25, 2018.

7. Blackwell DL, Lucas JW, Clarke TC. Summary health statistics for U.S. adults: national health interview survey, 2012. Vital Health Stat 10. 2014(260):1-161.

8. Isasi F and Krofah E. The expanding role of pharmacists in a transformed health care system. National Governors Association Center for Best Practices. 2015.

9. American Public Health Association. The role of the pharmacist in public health. 2006 Accessed at https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/07/13/05/the-role-of-the-pharmacist-in-public-health - Anchor 1, April 25, 2018.

10. McDonough R and Doucette W. Developing collaborative working relationships between pharmacists and physicians. J Am Pharm Assoc. 2001;41(5):682-92.

11. Bacci JL, Coley KC, McGrath K et al. Strategies to facilitate the implementation of collaborative practice agreements in chain community pharmacies. J Am Pharm Assoc. 2016;56(3):257-65 e2.

12. Snyder ME, Zillich AJ, Primack BA et al. Exploring successful community pharmacist-physician collaborative working relationships using mixed methods. Res Social Adm Pharm. 2010;6(4):307-23.

13. Zillich AJ, McDonough RP, Carter BL et al. Influential characteristics of physician/pharmacist collaborative relationships. Ann Pharmacother. 2004;38(5):764-70.

14. Doucette WR, Nevins J, McDonough RP. Factors affecting collaborative care between pharmacists and physicians. Res Social Adm Pharm. 2005;1(4):565-78.

15. Zillich AJ, Doucette WR, Carter BL et al. Development and initial validation of an instrument to measure physician-pharmacist collaboration from the physician perspective. Value Health. 2005;8(1):59-66.

16. Zillich AJ, Milchak JL, Carter BL et al. Utility of a questionnaire to measure physician-pharmacist collaborative relationships. J Am Pharm Assoc. 2006;46(4):453-8.

17. Otten JJ, Cheng K, Drewnowski A. Infographics and public policy: using data visualization to convey complex information. Health affairs (Project Hope). 2015;34(11):1901-7.

18. Comello ML, Qian X, Deal AM et al. Impact of game-inspired infographics on user engagement and information processing in an eHealth program. J Med Internet Res. 2016;18(9):e237.

19. Reid H, Milton K, Bownes G et al. Making physical activity evidence accessible: are these infographics the answer? Br J Sports Med. 2017;51(10):764-66.

20. Arcia A, Suero-Tejeda N, Bales ME et al. Sometimes more is more: iterative participatory design of infographics for engagement of community members with varying levels of health literacy. J Am Med Inform Assoc. 2016;23(1):174-83.

21. Yoon S, Cohen B, Cato KD et al. Visualization of data regarding infections using eye tracking techniques. J Nurs Scholarsh. 2016;48(3):244-53.

22. Haverkamp JJ and Vogt M. Beyond academic evidence: innovative uses of technology within e-portfolios in a doctor of nursing practice program. J Prof Nurs. 2015;31(4):284-9.

23. Yoon S and Gutierrez J. Behavior correlates of post-stroke disability using data mining and infographics. Br J Med Med Res. 2016;11(5).

24. U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. Infographics. overview. Accessed at https://www.cdc.gov/socialmedia/tools/InfoGraphics.html, April 25, 2018.

25. Carroll J, Grapsy J, Coley K et al. Utilizing prescription dispensing data to strategically engage prescribers in collaborative care with community pharmacists. Abstract 54. J Am Pharm Assoc. 2017;57(3):e17-e18.

26. Kahlke RM. Generic Qualitative Approaches: Pitfalls and Benefits of Methodological Mixology. Int J Qual Methods. 2014;13(1):37-52.

27. Chisholm-Burns MA, Kim Lee J, Spivey CA et al. US pharmacists' effect as team members on patient care: systematic review and meta-analyses. Med Care. 2010;48(10):923-33.

28. Giberson S, Yoder S, Lee M. Improving patient and health system outcomes through advanced pharmacy practice. A report to the U.S. surgeon general. Office of the Chief Pharmacist. U.S. Public Health Service. Dec 2011.

29. O'Daniel M and Rosenstein A Professional communication and team collaboration. Rockville, MD:Agency for Healthcare Research and Quality; 2008.

30. Centers for Medicare & Medicaid Services. MACRA. What's MACRA? Accessed at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-MIPS-and-APMs.html, April 25, 2018.

31. Baxter M. American Pharmacists Association. Pharmacy Today. New opportunitites under MACRA set stage for pharmacist-provided care. 2017 Accessed at https://www.pharmacytoday.org/article/S1042-0991(16)31654-1/pdf, April 25, 2018.