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Physician perspectives on collaborative working relationships with team-based hospital pharmacists in the inpatient medicine setting

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Abstract

Objective Collaborative care between physicians and pharmacists has the potential to improve the process of care and patient outcomes. Our objective was to determine whether team-based pharmacist care was associated with higher physician-rated collaborative working relationship scores than usual ward-based pharmacist care at the end of the COLLABORATE study, a 1 year, multicentre, controlled clinical trial, which associated pharmacist intervention with improved medication use and reduced hospital readmission rates.

Methods We conducted a cross-sectional survey of all team-based and usual care physicians (attending physicians and medical residents) who worked on the participating clinical teaching unit or primary healthcare teams during the study period. They were invited to complete an online version of the validated Physician-Pharmacist Collaboration Index (PPCI) survey at the end of the study. The main endpoint of interest was the mean total PPCI score.

Key findings Only three (response rate 2%) of the usual care physicians responded and this prevented us from conducting pre-specified comparisons. A total of 23 team-based physicians completed the survey (36%) and reported a mean total PPCI score of 81.6 ± 8.6 out of a total of 92. Mean domain scores were highest for relationship initiation (14.0 ± 1.4 out of 15), and trustworthiness (38.9 ± 3.7 out of 42), followed by role specification (28.7 ± 4.3 out of 35).

Conclusion Pharmacists who are pursuing collaborative practice in inpatient settings may find the PPCI to be a meaningful tool to gauge the extent of collaborative working relationships with physician team members.

Introduction

Interdisciplinary collaboration is a strategy to improve patient care, enhance patient safety and reduce workload and burnout among healthcare professionals.[1] Healthcare teams including pharmacists have received increased attention in several European countries,[2] the UK,[3] the USA[4] and Canada.[5]

We recently reported the results of the Capturing Outcomes of Clinical Activities Performed by a Rounding Pharmacist Practicing in a Team Environment (COLLABORATE) study, which demonstrated the beneficial effect of team-based clinical pharmacist care, in comparison to traditional ward-based pharmacist care, on medication use and hospital readmission in hospitalized patients.[6] We also reported qualitative experiences with interdisciplinary team care and explored issues related to the creation, development and maintenance of effective healthcare teams from the perspectives of participating pharmacists, nurse practitioners, physicians and patients.[7,8]

Several studies in hospitalized patients, including ours, suggest that physician–pharmacist collaboration improves

patient outcomes.[6,9] The purpose of the present study was to determine the extent to which physician-reported collaborative working relationships, as measured using the validated Physician-Pharmacist Collaboration Index (PPCI) survey, were different between physicians who worked together with pharmacists as a team over the course of the COLLABORATE study (team-based physicians) and physicians who worked with ward-based pharmacists during the same time period (usual care physicians). We hypothesized that team-based physicians would report higher collaborative working relationship scores than usual care physicians.

Methods

As part of the COLLABORATE study[6] we conducted a one-time online survey of all attending physicians and medical residents who worked on the participating clinical teaching unit (CTU) or primary healthcare teams (PHCTs) between 30 January 2006 and 2 February 2007 using the PPCI. Physicians who worked with a team-based pharmacist for at least 2 weeks were designated as team-based physicians, while those not meeting this criterion were designated as usual care. The invited team-based physicians ($n = 64$ potential participants) had worked with the study pharmacist as a team for a mean of 3.7 $\pm$ 2.0 weeks, and 32 (50%) had worked with the pharmacist for at least 4 weeks.

Team-based physicians were asked to complete the survey considering their relationship with the team-based pharmacist. Usual care physicians ($n = 130$) were asked to consider their relationship with the pharmacist they worked with most often while on the CTU or PHCT. All participants were identified using 'on-call' schedules and were invited to participate in February 2007, via an email initially sent by the investigative team. In an attempt to improve response rates, three reminder emails were sent by Department of Medicine administrative staff.

The PPCI is a validated 14-item self-administered questionnaire which measures collaborative working relationships in three different domains: relationship initiation (actions of one party to determine the needs of another party, thereby facilitating relationship development), trustworthiness (a practitioner's ability to trust another practitioner's word and expertise) and role specification (interactions between pharmacists and physicians in which they reach agreement on roles and responsibilities for each other in caring for mutual patients).[10] The total PPCI score ranges from 14 to 92, where higher scores represent a greater extent of collaboration (see Table 1[10]).

The main endpoints were the difference in mean total PPCI score between team-based physician and usual care physician groups as well as between-group differences in mean scores on each of the three PPCI domains. We estimated that approximately 25 participants per group would be needed to show a mean difference of 5 points, assuming a power of 80%, an alpha level of significance of 5% for a two-sided test and a standard deviation of 6 points. The study protocol was approved by the Health Research Ethics Board of the University of Alberta.

Results

A total of 26 physicians responded (overall response rate 13%), with 23 responses from team-based physicians (response rate 36%) and three responses from usual care physicians (response rate 2%). Due to the low response rate in the usual care group we felt it was inappropriate to conduct the pre-specified comparisons and therefore we focus on describing results from the team-based physician group, and evaluating their responses in the context of our main qualitative findings.[7]

Team-based physicians

The mean age of the respondents was 42.2 $\pm$ 11.7 years, 70% were male and they had practised for a mean of 13.0 $\pm$ 10.0 years (Table 2). The mean total physician-rated PPCI score was 81.6 $\pm$ 8.6 out of a total of 92 (Table 3). Mean physician-reported scores on the three PPCI domains were as follows: relationship initiation (14.0 $\pm$ 1.4 out of 15), trustworthiness (38.9 $\pm$ 3.7 out of 42) and role specification (28.7 $\pm$ 4.3 out of 35) (Table 3).

Discussion

In this study, we found high physician-rated collaborative working relationship scores when inpatient physicians worked in close collaboration with team-based pharmacists. These scores suggest that team-based physicians felt that team-based study pharmacists were active in providing patient care, were credible and could be trusted to follow up on recommendations, but that there is room for collaborative relationships to grow within the domain of role specification. Although our study is unique in that we are the first, to our knowledge, to explore inpatient physician-rated PPCI scores, there are several limitations that need to be considered. First, our survey had a low, but typical, response rate for an email survey and the high PPCI scores of intervention physicians may reflect a non-response bias.[11] While there are several plausible explanations for the low response in the usual care group, anecdotally we know that ward-based pharmacist services were typically reactive, responding to medication queries for patients with whom the pharmacist had little interaction and long after the decision to pursue a specific medication regimen had been made by a physician. Therefore, we suspect the response rate reflects a low level of physician engagement in collaborative practice with pharmacists

Table 1 Physician-Pharmacist Collaboration Index (PPCI)[10]

General instructions for team-based physicians:							
You have been identified as a physician who has worked with a study team-based pharmacist at some time in the past year while working on the internal medicine CTU or PHCTs. In answering the following questions please consider your relationship and interactions with the study pharmacist over time on the inpatient internal medicine or family medicine team.							
*Scale: 1 – Not at all, 5 – To a great extent							
¶Scale: 1 – Very strongly disagree, 7 – Very strongly agree							
A. Relationship initiation:*							
Please indicate the extent to which this pharmacist:							
1) Spent time trying to learn how he/she can help you provide better care	1	2	3	4	5		
2) Showed an interest in helping you improve your practice	1	2	3	4	5		
3) Provided information to you about a specific patient	1	2	3	4	5		
B. Trustworthiness:¶							
1) The pharmacist is credible	1	2	3	4	5	6	7
2) I trust this pharmacist's drug expertise	1	2	3	4	5	6	7
3) I can count on this pharmacist to do what he/she says	1	2	3	4	5	6	7
4) Communication between this pharmacist and myself is two-way	1	2	3	4	5	6	7
5) I intend to keep working together with this pharmacist	1	2	3	4	5	6	7
6) My interactions with this pharmacist are characterized by open communication of both parties	1	2	3	4	5	6	7
C. Role Specification:¶							
1) This pharmacist and I negotiate to come to agreement on our activities in managing drug therapy	1	2	3	4	5	6	7
2) This pharmacist and I are mutually dependent on each other in caring for patients	1	2	3	4	5	6	7
3) I will work with this pharmacist to overcome disagreements on his/her role in managing drug therapy	1	2	3	4	5	6	7
4) In providing patient care, I need this pharmacist as much as this pharmacist needs me	1	2	3	4	5	6	7
5) This pharmacist depends on me as much as I depend on him/her	1	2	3	4	5	6	7
D. Demographics							
1. Age: years							
2. Years of residency training: years							
3. How many years have you practiced medicine: years							
4. Gender: Male Female							
5. Practice type: (check one) family medicine internal medicine							
6. Academic affiliation: (check one) a. Intern, resident, fellow b. Part time/adjunct faculty appointment c. Full time faculty appointment d. No faculty affiliation							
7. Institution: (check one) Hospital A Hospital B Hospital C							
8. During a typical week (in the internal medicine CTU or family medicine service), approximately how many individual patients do you see? (Include outpatients and emergency room patients that aren't admitted; count each individual patient only once) a. ≤75 b. 76–100 c. 101–125 d. ≥126							
9. Other comments:							
Possible score ranges							
Total score: between 14 and 92. Relationship initiation: between 3 and 15; Trustworthiness: between 6 and 42; Role specification: between 5 and 35.							

CTU, clinical teaching unit; PHCT, primary healthcare team.

Table 2 Demographic characteristics

	Team-based physicians (n = 23)*
Demographics	
Age	42.2 ± 11.7
Male gender	16 (69.6)
Years of residency training	4.1 ± 2.9
Number of years in practice	13.0 ± 10.0
Practice type	
PHCT	8 (34.8)
Internal medicine CTU	15 (65.2)
Attending physician	17 (73.9)
Practice site	
Hospital A	10 (43.5)
Hospital B	4 (17.4)
Hospital C	9 (39.1)
Number of patients seen per week	
≤75	19 (82.6)
>75	4 (17.4)

*All data are *N* (%) or mean ± SD unless otherwise specified. CTU, clinical teaching unit; PHCT, primary healthcare team.

Table 3 Team-based physician-rated Physician-Pharmacist Collaboration Index (PPCI) domain scores (n = 23)

PPCI score (possible range)	PPCI score* (mean ± SD)	Range
Total score (14–92)	81.6 ± 8.6†	56–92
Domain		
Relationship initiation (3–15)	14.0 ± 1.4	11–15
Trustworthiness (6–42)	38.9 ± 3.7	26–42
Role specification (5–35)	28.7 ± 4.3†	19–35

*Higher scores represent a more advanced relationship.
†n = 22 as one physician had two missing values in the role-specification domain.

in the ward-based model. Unfortunately, we did not capture instances where usual care physicians visited the survey site but decided not to complete the survey because they could not identify a pharmacist with whom they worked regularly. Second, although half of team-based physicians had worked with the study pharmacist for at least 4 weeks, this time frame still may not be sufficient to develop high-level collaborative relationships especially in the context of a 1 year study where future collaboration was not guaranteed. More so, one may question whether the 2 week cutoff was sufficient for physicians to be labelled as 'team-based' and make meaningful decisions about pharmacist collaboration. Currently, there is no consensus on when a group of individuals becomes a 'team' and this time point was chosen primarily for convenience based on sample size considerations as well as subjective comments from the study pharmacists regarding team dynamics. Finally, our results may not be typical where facilitating characteristics such as a willingness to work in teams, a teaching environment and formal daily patient bedside rounds do not exist.

Despite the limitations, we found several areas of consistency between our PPCI findings and the results of our previously published qualitative investigation which suggested that team processes, organizational and practice structures, professional development needs and perceived impacts on patient care were all important factors in teamwork.[7] In that paper we discussed how collaboration was more successful when relationships were built on mutual respect and trust, the importance of role clarity in developing positive relationships and how organizational barriers such as scheduling and logistics could be challenges.[7] Thus neither our high PPCI trustworthiness scores nor our generally lower role specification scores came as a surprise.

Additionally, our results seem to compare favourably with more 'traditional' community-based applications of the PPCI. For example, our physician-rated PPCI scores were higher across each domain compared to a previously published random sample of primary care physicians.[12] While there is no cutoff on the PPCI that indicates a 'strong' collaborative working relationship, our total PPCI score was similar to that reported by Snyder *et al.*, who surveyed a small number of community pharmacist–physician pairs engaged in 'highly successful' collaborative working relationships and documented a mean total PPCI score of 89.8 ± 4.6 (range 85–96).[13]

The implications of our project are threefold. First, whereas our study helps to further validate the PPCI and demonstrates that it is applicable to the inpatient setting, if we were to repeat our study again we would administer the PPCI several times to see how collaborative working relationships change over time, as has been done by other investigators.[10] Second, we suggest that other approaches are required to increase physician PPCI survey response such as using mixed modes of delivery (mail, telephone, in person), personalization of the survey instrument and contacts with respondents, endorsement of the survey by opinion leaders and potentially monetary incentives.[14] Finally, our results provide valuable insights for pharmacists seeking to work collaboratively with physicians regarding the specific domains of collaborative relationships where responding physicians perceived strong relationships with pharmacists (i.e. relationship initiation and trustworthiness) and domains where relationships need time to grow.

Conclusion

In the COLLABORATE randomized trial of team-based pharmacist care in an inpatient setting, we demonstrated a high level of physician–pharmacist collaboration, particularly in the areas of relationship initiation and trustworthiness. Role specification scores were lower and may indicate an area for improvement. Pharmacists who are pursuing collaborative practice in inpatient settings may find the PPCI to

be a meaningful tool to gauge the extent of collaborative working relationships with physician team members.

Declarations

Conflict of interest

The Author(s) declare(s) that they have no conflicts of interest to disclose.

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