



## Original article

# Barriers interfering with establishment of Collaborative Drug Therapy Management (CDTM) agreements between clinical pharmacists and physicians

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## ABSTRACT

**Purpose:** The current level of awareness among health care providers towards working under collaborative agreements, and the barriers that interfere with establishing CDTM agreements between clinical pharmacists and physicians were studied.

**Methods:** A structured survey was developed after reviewing the literature on CDTM. The questions were validated to assess the level of awareness regarding the role of clinical pharmacists in providing drug therapy management, and to determine the main barriers for not having collaborative agreements with different specialties. In addition to demographic data, physicians' education background, reasons for not having clinical pharmacy services in their clinics, and their perceptions for signing a collaborative agreement were also collected. The sample for the study was obtained from different health specialties in Saudi Arabia. The validated survey was sent and received within approximately two months, Oct–Nov 2017.

**Results:** We have received 55 responses from different sectors, a 79% response rate. Most physicians had worked before with a clinical pharmacist (76%) and of which 60% valued the services provided by the clinical pharmacist as extremely important and very important (29.1%; 30.9%) respectively. When physicians asked if they have heard about the Collaborative Drug Therapy Management agreement or the term CDTM, 67% of respondents haven't heard that before. Most of the responses, regarding the physicians' awareness of the actual CDTM agreement services, were correct. Only 18% selected incorrect CDTM services. The results showed higher percentages of physicians agreeing with the benefits of CDTM agreement as it can improve overall patient care, reduces risk of drug related adverse events or interactions and allows clinical pharmacists to be part of patient care; 85.5, 83.6 and 83.6 respectively. Physicians who rated the possibility to be involved or to encourage other health care professionals in signing collaborative agreements as high were 76.3 and 74.5 respectively. Based on their specialty, emergency medicine's physicians were most likely to have a CDTM agreement and to encourage others too. On a scale from zero to hundred, the average of the responses rating lack of knowledge about such an agreement as potential barrier on preventing CDTM agreements was  $69 \pm 0.30$ . While the gender barrier had the lowest rating with a mean of 15.

**Conclusion:** There is a huge lack of knowledge and understanding about the role of clinical pharmacists and in CDTM concept. This lack of knowledge affected on having collaborations between clinical pharmacists and physicians in different settings. Educating health care providers and stakeholders about the role of clinical pharmacists in providing drug therapy management and encouraging the concept of CDTM among healthcare providers are the main solutions to enhance clinical pharmacist's role in patient care. © 2019 The Authors. Production and hosting by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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## 1. Introduction

In 2003, ACCP proposed a position statement to defend the role of pharmacists and to gain the recognition from other health care providers (Hammond, 2003). Ten years later, the American Pharmacists Association (APhA) Foundation also regulated a roundtable meeting in Washington, for the same purposes. Most of their dis-

cussions resulted in confirming that pharmacists are underutilized resource that could provide a more diverse skill mix and more efficient delivery system (Hammond, 2003).

Several studies showed the raise in Drug Information Centers' requests from different health care professionals, especially physicians. Likewise, health providers seek pharmacists' knowledge and help, as seen in Pharmacy and Therapeutic committees, for a greater drug selection that is cost-effective and is of a good quality. Which will ultimately improve pharmacotherapeutic outcomes and provide increased value and efficiency to the health care system. These results suggest that clinics or health systems with clinical pharmacists should consider reallocation of duties to provide a direct patient management (Hammond, 2003).

Collaborative Drug Therapy Management (CDTM) is an agreement protocol for collaborative practice to be signed by both the physician and the clinical pharmacist (APhA Foundation). It declares the clinical pharmacist authority in performing patient assessments; ordering laboratory tests; and selecting, monitoring and adjusting drug regimens (Hammond, 2003).

To get the desired outcomes on patient health, both physician and pharmacist have to work closely with an interdependent relationship manner (Doucette et al., 2005). In the final results of Project IMPACT, where they evaluated the role of clinical pharmacists in diabetes managements, they found that clinical pharmacists can provide improved clinical and financial outcomes (Bluml et al., 2014). In another study, they compared the intervention applying interdisciplinary pharmacist-physician collaboration with a control group in managing blood pressure, their findings favored the pharmacists' interventions (Carter et al., 2009). Similarly, sufficient studies conducted in Saudi Arabia showed a positive impact of clinical pharmacists' interventions with ophthalmic clinic, antidiabetics' adherence and cardiac-surgery ICU patients (Al-Jazairi et al., 2008; Al-Jumah and Qureshi, 2012; Alzuman and Al-Humaidan, 2017). When the outcomes from the annual wellness visits (AWVs) preventive services were studied, the acceptance rate as well as the financial gain were increased with the referrals, making medication changes and ordering preventive screenings (Alhossan et al., 2016).

Not to mention, the growing numbers of drugs' registry have been associated with the increase in prescribing errors. Researchers have found that in institutions where pharmacists' recommendations are adopted in patient care areas, the rate of medication errors was reduced (Hammond, 2003).

In many countries, pharmaceutical care has been practiced for few decades, and thus they have measured the factors and barriers as well (Hammond, 2003). These articles observed the behavioral barriers and attitudes that hinder the growth of collaboration between physicians and pharmacists. The published results helped many health institutions applying processes and procedures in order to obtain the major benefits from these collaborations (McDonough and Doucette, 2001). Notably, these results also showed the variations of barriers upon different state legislation, practice environments, and the education of health care providers (Hammond, 2003).

These barriers included lack of resources as the major barrier, lack of manpower, and lack of unified job description and responsibilities (Hammond, 2003).

However, eastern countries such as Jordan, Kuwait and Saudi Arabia, clinical pharmacists' job title and education system both recently introduced and the implementation of CDTM faces some challenges and barriers that observed in many hospital settings (Al-Wazaify et al., 2006). Therefore, limited literature can be found that explored the barriers and physicians' attitude towards signing a protocol with a qualified pharmacists. To address the gap in the literature, the aim of this study was to identify the barriers that interfere with establishing collaborative drug therapy

management agreements between clinical pharmacists and physicians using a structured survey in a teaching hospital in Saudi Arabia.

## 2. Methods

A cross sectional study to assess the potential barriers that can interfere with establishing collaborative drug therapy management between clinical pharmacists and physicians. A survey was developed after reviewing the literature on CDTM. The questions were piloted, and the survey was validated by administrating it to different healthcare specialists to make sure the survey achieves the proposed objectives and was distributed online to targeted sample. An approval to conduct the research was obtained from the institutional Review Board (IRB) at King Saud University Medical City prior conducting the research. In addition to demographic data, physicians' education background, reasons for not having clinical pharmacy services in their clinics, their experience in working with clinical pharmacists, physicians' awareness of the actual CDTM agreement services provided and their perceptions for signing a collaborative agreement were also collected. Also, the main barriers they face to sign CDTM agreement were collected. The study was conducted between Oct-Nov 2017, in an outpatient setting and included physicians from different specialties. Descriptive analyses were applied using Excel program to analyze the collected data.

**Table 1**  
Respondents<sup>a</sup> demographics.

Characteristic	n (%)	n (%)	
		Had worked with a clinical pharmacist	Have heard about CDTM
<i>Gender</i>			
Female	19 (34.6)	14 (73.7)	6 (31.6)
Male	36 (65.5)	28 (77.8)	12 (33.3)
<i>Age</i>			
<25 years	0		
25–34	23 (41.8)	17 (73.9)	4 (17.4)
35–44	24 (43.6)	19 (79.2)	9 (37.5)
45–54	6 (10.9)	5 (83.3)	4 (66.7)
55–64	2 (3.6)	1 (50.0)	1 (50.0)
≥65	0		
<i>Specialty</i>			
Family Medicine	26 (47.3)	16 (61.5)	12 (46.2)
Emergency Medicine	8 (14.5)	6 (75.0)	3 (37.5)
Pediatric	6 (10.9)	5 (83.3)	1 (16.7)
Cardiology	4 (7.3)	4 (100)	0
Surgery	3 (5.5)	3 (100)	1 (33.3)
Internal Medicine	2 (3.6)	2 (100)	1 (50.0)
Primary Care	2 (3.6)	2 (100)	0
Other	4 (7.3)	4 (100)	0
<i>Countries of study/training</i>			
Saudi Arabia	45 (81.8)	35 (77.8)	16 (35.6)
United States	9 (16.4)	7 (77.8)	3 (33.3)
Canada	8 (14.6)	6 (75.0)	2 (25.0)
Gulf-countries	5 (9.1)	3 (60.0)	1 (20.0)
Australia	4 (7.3)	3 (75.0)	2 (50.0)
Europe	4 (7.3)	2 (50.0)	1 (25.0)
Other	5 (9.1)	5 (100)	3 (60.0)
<i>Experience (years of practice)</i>			
<1	1 (1.8)	0	0
1–3	11 (20.0)	9 (81.8)	3 (27.3)
4–10	25 (45.5)	20 (80.0)	7 (28.0)
11–20	14 (25.5)	10 (71.4)	6 (42.9)
>20	4 (7.3)	3 (75.0)	2 (50.0)
<i>Total</i>			
Yes		42 (76.4)	18 (32.7)
No		13 (23.6)	37 (67.3)

<sup>a</sup> Total responses is 100% (N = 55).

### 3. Results

Fifty-five physicians from different specialties were included (Table 1). Most physicians had worked before with a clinical pharmacist (76%) and of which 60% valued the services provided by the clinical pharmacist as extremely important and very important (29.1%; 30.9%) respectively. When physicians were asked if they have heard about the collaborative drug therapy management agreement or the term CDTM, 67% of them haven't heard about it before. Most of responses, regarding the physicians' awareness of the actual CDTM agreement services, were correct. Furthermore, only 18% selected incorrect CDTM services (Fig. 1).

The results showed higher percentages of physicians agreeing with the benefits of CDTM agreement as it can improve overall patient care, reduces risk of drug related adverse events or interactions and allows clinical pharmacists to be part of patient care; 85.5, 83.6 and 83.6 respectively (Table 2). Seventy-six percent of physicians rated high for the possibility to be involved in signing collaborative agreements, and seventy-four percent of them also rated high for encouraging other health care professionals in signing collaborative agreements. Based on their specialty, Emergency Medicine's physicians were most likely to have a CDTM agreement and to encourage others too (Table 3).

On a scale from zero to hundred, the mean  $\pm$  SD of responses rating lack of knowledge about such an agreement as potential barrier on preventing CDTM agreements was  $69 \pm 0.30$ , followed by lack of experience in working with clinical pharmacists by  $59 \pm 0.29$ , and lack of qualified clinical pharmacists in your institution by  $52 \pm 0.35$  (Table 4). Administration and funding barriers were also reported as major barriers by  $54 \pm 0.32$  and  $50 \pm 0.33$  respectively. Most of the respondents didn't see that gender differences is a major barrier to have CDTM agreement gave it only  $15 \pm 0.22$  out of 100.

### 4. Discussion

The study evaluates the availability and acceptability of CDTM concept in hospitals in Saudi Arabia. To our knowledge, this is the first study to assess this concept and to look into the barriers that can interfere with its future in Saudi Arabia and Gulf region. The study found that there is a huge lack of knowledge among

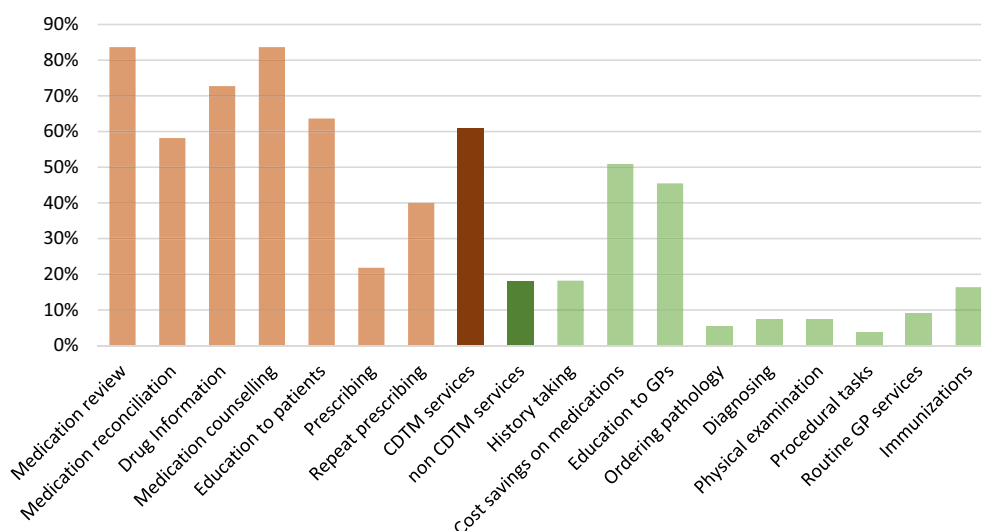
physicians about the role of clinical pharmacists in different settings. In addition, there is almost no previous knowledge or experience in the concept of CDTM that be implemented among healthcare providers in different specialties. This is may be due to that most of the participants are from Saudi Arabia, and the concept of CDTM is not introduced very well in the Kingdom as it is introduced in the United States or some European countries. Despite the great supportive literature of the positive impact of CDTM toward patient care, yet we don't see any serious movements to establish such services in the Middle East and in particular Saudi Arabia as a leading country of health in the region. Therefore, we aimed to study the reasons of these weak movements toward implementing this service, and our data revealed that the main reason is lack of knowledge and experience, and most of the participants told that education about role of clinical pharmacists and CDTM is the major solution to have this service. Therefore, clinical pharmacists who want to establish CDTM should start by educating other healthcare providers about their roles and the benefits of this service toward patient care. Also, they need to know that building a trust between healthcare practitioners is a crucial role to establish this service and other services. (Biltaji et al., 2016) In addition, physicians nowadays have major

**Table 2**  
Respondents' opinion on CDTM agreements.

	n (%)
<i>CDTM</i>	
Has a significant impact on patient health	38 (69.1)
Can improve overall patient care	47 (85.5)
Can reduce risk of drug related AE <sup>b</sup> or interactions	46 (83.6)
Allow clinical pharmacists to be part of patient care	46 (83.6)
Doesn't provide much help in patient care	1 (1.8)
<i>Actions can help to implement CDTM agreements<sup>a</sup></i>	
Educate HC <sup>b</sup> providers about such agreement	51 (96.2)
Convince SH <sup>b</sup> by providing evidence from the literature about CDTM role in HC <sup>b</sup> system	39 (73.6)
Change clinical pharmacy practice in SA <sup>b</sup> so it can allow having such agreement	42 (79.2)
Increase the number of clinical pharmacists who work in clinics	43 (81.1)

<sup>a</sup> Total responses is not 100% (N = 53).

<sup>b</sup> AE = adverse events; HC = health care; SH = stakeholders; SA = Saudi Arabia.



**Fig. 1.** Respondents were asked to select what they think is (are) provided by the clinical pharmacist upon CDTM agreement. The red columns (left) are representing the correct CDTM agreement services provided by the clinical pharmacist. While the right-sided columns are general services provided normally by other health care professionals but not by the clinical pharmacist who signed a CDTM agreement.

**Table 3**  
Respondents<sup>a</sup> involvement and/or encouragement based on their specialty.

Characteristic	n (%)					
	Likely to be involved in a CDTM			Likely to encourage other physicians		
	High	Moderate	Low	High	Moderate	Low
<i>Specialty</i>						
Family medicine	17 (65.4)	6 (23.1)	3 (11.5)	21 (80.8)	3 (11.5)	2 (7.7)
Emergency medicine	6 (75.0)	2 (25.0)	0	8 (100)	0	0
Pediatric	4 (66.7)	1 (16.7)	1 (16.7)	4 (66.7)	1 (16.7)	1 (16.7)
Cardiology	1 (25.0)	1 (25.0)	2 (50.0)	2 (50.0)	1 (25.0)	1 (25.0)
Surgery	2 (66.7)	1 (33.3)	0	1 (33.3)	2 (66.7)	0
Internal medicine	2 (100)	0	0	1 (50.0)	1 (50.0)	0
Primary care	2 (100)	0	0	1 (50.0)	1 (50.0)	0
Other	3 (75.0)	1 (25.0)	0	3 (75.0)	1 (25.0)	0
Total	37 (76.3)	12 (21.8)	6 (10.9)	41 (74.5)	10 (18.2)	4 (7.3)

<sup>a</sup> Total responses is 100% (N = 55).

**Table 4**  
Respondents<sup>a</sup> rating each potential barriers on preventing CDTM agreements.

Barriers	Mean <sup>b</sup> ± SD
<i>CDTM barriers</i>	
Lack of knowledge about such an agreement	69 ± 0.30
Lack of experience in working with clinical pharmacists	59 ± 0.29
Lack of qualified clinical pharmacists in your institution	52 ± 0.35
Administration barriers	54 ± 0.32
Historical competition	30 ± 0.27
Differences in schedules and professional routines	46 ± 0.29
Varying levels of preparation, qualifications, and education	41 ± 0.29
Fears of diluted professional identity	31 ± 0.29
Differences in accountability, payment, and rewards	31 ± 0.30
Concerns regarding clinical responsibility	44 ± 0.33
Lack of physical space	34 ± 0.32
Logistical issues	40 ± 0.29
Funding	50 ± 0.33
Complexity of care	33 ± 0.29
Gender barrier	15 ± 0.22

<sup>a</sup> Total responses is 100% (N = 53).

<sup>b</sup> Rating scale is from zero to 100, in which (0 = not being a barrier in preventing CDTM implementation).

issue with following up with patients due to the large volume of patients they see on a daily basis and shortage of healthcare providers in the country. Therefore, they need to find other solutions to maintain best patient care such as filling these gaps with highly-qualified healthcare practitioners like clinical pharmacists. Also, clinical pharmacists should appreciate their role in patient care and try to provide best care hand-by-hand with other healthcare providers. Understanding the findings of this study and applying them can help many clinical pharmacists to navigate easily toward implementing CDTM. The study has several limitations, such as the small sample size, and the localization of the sample in one region. However, it provided great insight on the barriers that can prevent many clinical pharmacists from providing best patient care through CDTM agreements. Given these results, we conclude that all of these barriers are manageable and modifiable by educating healthcare workers about the roles of clinical pharmacists at different settings. Also, by providing real-life data about the impact of

clinical pharmacists involved in CDTM agreements to stakeholders and healthcare providers.

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