

Assessing the Implementation of the Chronic Care Model in Quality Improvement Collaboratives: Does Baseline System Support for Chronic Care matter?

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Abstract. While collaboratives are an increasingly popular approach to facilitating quality improvement (QI) in healthcare organizations, little is known about the effective implementation of collaborative processes or organizational change activities motivated by collaborative participation. The RAND/Berkeley Improving Chronic Illness Care Evaluation of chronic care collaboratives has found overall modest levels of implementation depth, with significant variation among participant organizations. Findings suggest a nonlinear relationship between the organizations' initial assessment of their systems' support for chronic care and their subsequent QI implementation performance. Teams that begin with middle levels of support had the greatest depth of implementation. Organizations that rated their chronic care systems as more developed, the majority of which were publicly funded, were at greatest risk for poor implementation. Risk stratification of organizations and collaborative targeting of QI guidance and facilitation are discussed.

Keywords. Quality Improvement Implementation, Intervention Strategies, Chronic Care Model, Quality Improvement Collaboratives.

1. Introduction

Increasingly, healthcare providers are turning to quality improvement (QI) collaboratives as a means for motivating and enhancing QI implementation within their organizations (Ovretveit et al., 2002). The collaborative QI process, developed by the Institute for Healthcare Improvement (IHI), brings together teams from 20 or more healthcare organizations three times over the course of a year to work together in learning how to improve care. In between learning sessions, the teams focus on small, rapid cycle changes within their own healthcare organizations, while an expert faculty provides clinical and technical guidance throughout the collaborative (IHI, 2003).

Little is known as yet about the effectiveness of this QI approach or about the factors that relate to collaborative effectiveness. The RAND/Berkeley Improving Chronic Illness Care Evaluation (ICICE) team currently is in the process of assessing the implementation and impact of collaboratives specifically focused on improving chronic care (Cretin et al., 2003). Preliminary results indicate that the collaboratives were successful in motivating organizations, on average, to implement large numbers of QI change strategies, with modest depth of implementation. While all organizations implemented interventions across most, if not all, of the CCM areas, they varied significantly in the quantity ($p < .001$) and depth ($p < .05$) of their implementation activities (Pearson et al., 2003). One possible explanation for this variation is that organizations' ability to implement multiple, diverse strategies with substantial depth depends in part on the systems they have in place to start with. In this paper, we examine the relationship between the systems for supporting chronic illness care that the organizations bring to the collaborative and their subsequent QI implementation performance.

2. Methods

2.1 Sample

This study sample consists of 36 organizations that participated in the ICICE and had completed the baseline Assessment of Chronic Illness Care (ACIC) survey. Of these organizations 30 took part in one of two Chronic Care Breakthrough Series Collaboratives, sponsored jointly by the IHI and the Improving Chronic Illness Care (ICIC). The remaining 6 organizations in our sample participated in a regional collaboratives (Washington State Diabetes Collaboratives II) sponsored by the Washington State Department of Health. Conducted between 1998 and 2002, these chronic care collaboratives encouraged change strategies emphasized by the Chronic Care Model (CCM), a loosely configured package of change concepts directed towards both activating patients and facilitating planned care by prepared provider teams. The CCM recommends system change in six areas: delivery system redesign, patient self-management support, decision support, information support, community linkages, and health system support. These 36 organizations focused on different chronic conditions: 10 on CHF, 10 on diabetes, 5 on depression, and 11 on asthma. Seventeen (47%) were publicly funded or government organizations (either Bureau of Primary Health Care (BPHC) clinics, Veterans Health Administration services within the Department of Veteran Affairs, or county health organizations).

2.2 Data Collection

The collaborative teams were asked to complete the ACIC survey at the beginning of the collaborative to evaluate the extent to which their systems were already set up to provide optimal chronic care and the areas in need of improvement. The ACIC instrument includes twenty-eight items that cover all six areas of the CCM. For each item, response choices range from 0-11, with a lower score indicating less organizational support for chronic illness care. Details about this instrument can be found in Bonomi et al., 2002.

Data on the organizations' implementation activities were available from monthly reports (called Senior Leader reports) that contained brief descriptions of their monthly progress on change activities during the course of the collaborative. These reports were supplemented with materials the sites presented at the concluding session of the collaborative. Additional information was gathered by the ICICE research staff in exit telephone interviews with each organization's team coordinator(s) (Pearson et al., 2003).

2.3 Measures

We used the ACIC baseline data to measure the system support for chronic illness care that the organizations brought to the collaborative. We derived the system support variable by averaging the responses of all items. Based on their average score, the 36 organizations were equally divided into one of the three groups: low, medium, or high support.

We used a previously developed method (Pearson et al., 2003) to measure the QI implementation performance of the study organizations. This method first coded each reported change activity using a hierarchical, 3-level coding tree based on the Chronic Care Model. We then used pre-specified criteria to assign the depth of implementation rating to each organization's actual change activities at the 2nd level of the CCM tree. There were 23 2nd level codes grouped under the six CCM elements; each had a scale of 0 to 2:2 indicates a major change activity judged likely to have substantial impact; 1 some reported change activity but not of much depth; and 0 no change activity. These depth scores were summed to derive measures of implementation intensity overall and within CCM elements.

2.4 Analysis

We utilized an approximate F-test to analyze whether these measures of implementation intensity significantly differed among the study organizations. Then we used descriptive statistics, analysis of variance (ANOVA), and graphs to explore the patterns between system support for chronic illness care and the depth of CCM implementation. We also explored whether the chronic condition of focus, the respective collaborative, and type of organization (public vs. nonpublic) were related to the system support and depth of CCM implementation.

3. Results

During the course of the collaborative, the 36 sites made modest depth of changes to align with the CCM, averaging 49% of the highest depth rating possible, with a range from 17% to 76%. The most intensive efforts were placed in information support (average depth 62%) and the least were in delivery system redesign (44%). Approximate F-tests showed individual organizations varied significantly in their depth of overall CCM implementation ($p < 0.001$), as well as in delivery system redesign ($p < 0.05$).

These organizations began with basic level of system support for chronic illness care. Their mean baseline ACIC score is 4.4 (40% of highest score possible), with a range from 0.95 to 8.25. The teams reported the best support was in the area of organization of care (such as leadership, organizational goals, and improvement strategies for chronic illness care), while the least support was in the area of information systems (such as registry, reminders to providers, and feedback).

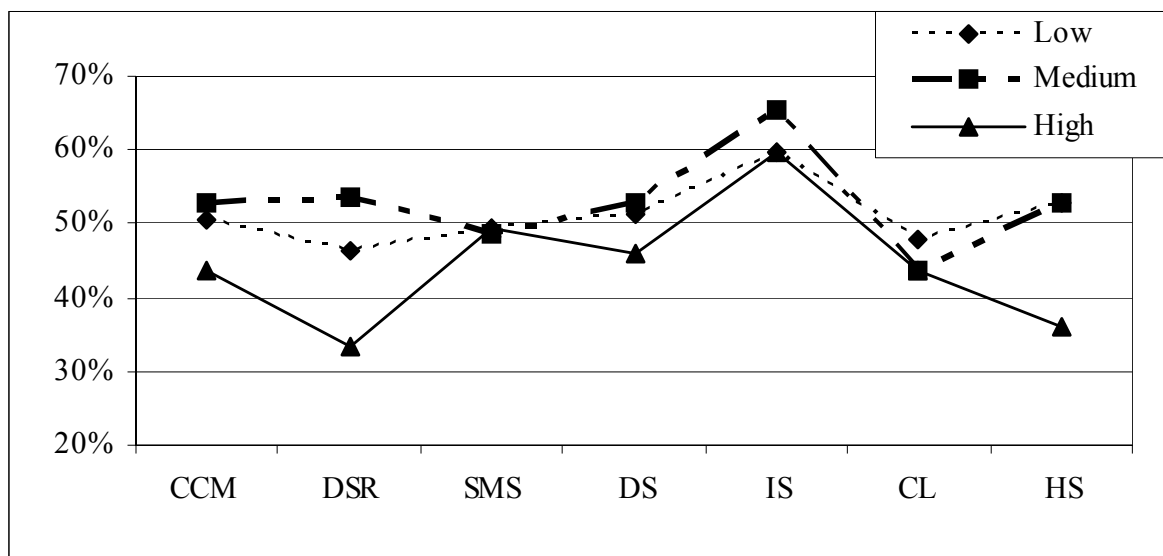
Table 1. *Characteristics of the Study Organizations and Overall Implementation of the Chronic Care Model.*

Support Level	Low		Medium		High		TOTAL	
	N	Mean [†]	N	Mean [†]	N	Mean [†]	N	Mean [†]
Overall	12	51%	12	53%	12	44%	36	49%
Conditions studied								
CHF	5	56%	3	53%	2	46%	10	53%
Diabetes	6	48%	2	62%	2	46%	10	50%
Depression	0	N/A	2	49%	3	41%	5	46%
Asthma	1	39%	5	50%	5	44%	11	47%
Collaboratives								
Chronic 2	7	55%	4	53%	3	43%	14	52%
Chronic 3	1	39%	7	50%	8	43%	16	46%
WSDC II	4	45%	1	70%	1	54%	6	51%
Organization type								
Non-public	11	51%	6	57%	2	53%	19	53%
Public	1	48%	6	48%	10	42%	17	45%

[†] Average depth of overall implementation of the Chronic Care Model, as presented by percentage of highest depth rating possible (46 points). For example, a 50% mean represents an average of 23 points in the depth rating, were given to the sites.

Twelve organizations with their ACIC score 3.55 and lower were categorized as low support (mean 2.6); twelve with a score between 3.56 and 5 were in medium support group (mean 4.4); and the rest twelve with score greater than 5 were in high support group (mean 6.2). Table 1 shows the nonlinear relationship between level of system support for chronic illness care and the organization's overall CCM implementation performance. The 12 organizations that reported medium support at baseline had more depth of the overall CCM implementation (53%) than the 12 organizations that had low support (51%), which in turn outperformed the 12 organizations that had high support to

begin the collaborative participation (44%). The organizations with medium support at baseline performed the most intensive CCM implementation in most of the subgroup breakdown by chronic condition of focus, the respective collaborative they participated, or type of organization (Table 1). These organizations also outperformed the other two groups in most elements of the CCM (Figure 1), while the organizations that had low support closely followed the medium support group. Nevertheless, the organizations that had the high support to begin with performed the least implementation of the CCM, especially in the areas of delivery system redesign ($p < 0.05$) and health system support ($p < 0.1$).



CCM = Overall CCM Implementation. DSR = Delivery System Redesign. SMS = Self-Management Support. DS = Decision Support. IS = Information Support. CL = Community Linkages. HS = Health System Support.

Figure 1. Average Depth of Implementation of the Chronic Care Model as a Whole and in Individual CCM Elements by Level of System Support for Chronic Illness Care.

4. Discussion and Conclusions

The above findings suggest that it is difficult to implement the CCM at a substantial level of intensity in one year. No organization came close to the maximum depth rating (46) possible, while the average implementation only reached half of the highest rating possible. In addition, we found statistically significant variation in organizations' implementation performance. Why did some organizations achieve higher levels of implementation than others? The literature suggests that various organizational attributes, including culture, leadership commitment to quality improvement, climate, and motivation, may help explain such differences (Shortell et al., 1995; Shortell et al., 2001). This study found the level of system support for chronic illness care that the organizations brought to the collaborative may be related to their subsequent CCM implementation performance.

With a mean baseline ACIC score of 4.4, these organizations started with chronic care systems that were far from optimal. This finding agrees with recent research documenting the relatively low use of care management processes in physician organizations in the United States (Casolino et al., 2003; Rundall et al., 2002).

Since the ACIC is a self-reported instrument, it measures respondents' perceptions of their initial chronic care systems. These perceptions, in turn, are likely to be influenced by the respondents' motivations, understanding, and expectations, in addition to their systems' actual capacities. Although a plausible reason for the less changes implemented in the high support group is less room on the upside, this group only had a mean ACIC score 6.2, leaving almost 50% room for improvement. Another possible explanation is that the higher ACIC scores mask a lack of understanding, either of the ACIC instructions or of the characteristics of optimal chronic care systems. A recently convened group of collaborative evaluators agreed that some teams do not fully understand the improvement process until at least halfway through the collaborative and suggested better guidance and preparation prior to the first Learning Session (Øvretveit et al., 2002).

Higher scores also may reflect limited expectations on the part of some respondents of their systems' potential for improvement or team response to internal pressures to look good. Most (83%) of the organizations that reported higher support at baseline were those classified as government or publicly funded organizations. With different resource constraints and patient populations, these teams may have had lower expectations about their system's potential for optimizing support for chronic illness care and adjusted their ACIC ratings accordingly. If some such limitations actually did hamper the intensity of their implementation performance, their ACIC scores may have acted as risk indicators, signaling their risk for poor implementation performance.

Further research is needed on the correlates of ACIC scores. The validity of the ACIC instrument in objectively measuring the strengths and weaknesses of chronic illness care delivery systems should be further assessed. The relationship between teams' perceptions of their organization's need for improvement and their subsequent QI implementation performance should receive further study as well. If this relationship is better understood, measures of collaborative participants' *perceptions* of their organization's need for improvement might offer collaborative organizers a means to risk stratify their participant teams and more effectively target their QI guidance and facilitation.

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