Quality improvement teams, super-users, and nurse champions: a recipe for meaningful use?

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ABSTRACT

Objective This study assessed whether having an electronic health record (EHR) super-user, nurse champion for meaningful use (MU), and quality improvement (QI) team leading MU implementation is positively associated with MU Stage 1 demonstration.
Methods Data on MU demonstration of 596 providers in 37 ambulatory care clinics came from the clinical data warehouse and administrative systems of UNC Health Care. We surveyed the 37 clinics about champions, super-users, and QI teams. We used generalized estimating equation methods with an independence working correlation matrix to account for clustering within clinics and to weight contributions from each clinic according to clinic size.
Results Having a QI team lead MU implementation was significantly associated with MU demonstration (odds ratio, OR = 3.57, 95% CI, 1.83-6.96, $P < .001$, Table 2). Having neither a nurse champion nor an EHR super-user was significant.
Conclusion Our findings support the alignment of MU with QI efforts by having the QI team lead MU implementation.

Keywords: electronic health records, meaningful use, nurse champion, super-user, quality improvement

BRIEF COMMUNICATION

BACKGROUND

The Health Information Technology for Economic and Clinical Health (HITECH) Act provided an unprecedented investment in health IT,[1] including financial incentives through the Centers for Medicare and Medicaid Services (CMS) for providers and hospitals that demonstrate meaningful use (MU) objectives for electronic health records (EHRs). MU objectives are being implemented in 3 stages,[2] with the goal being to capitalize on the potential of EHRs to facilitate improvements in safety, quality, and efficiency of care.[1,3,4] Although evidence to date is mixed regarding such improvements,[3,5–8] preliminary studies suggest that demonstrating MU objectives may contribute to improving health care quality more than simply adopting EHRs.[9,10]

While studies have analyzed hospital characteristics associated with EHR adoption and successful MU implementation,[11,12] little is known about approaches used within ambulatory practice settings that contribute to variations in MU demonstration between settings within the same integrated delivery system. Findings from 1 qualitative study suggest that if practices focus on individual tasks required by MU objectives (eg, documentation requirements) without adequate support for providers and integration of MU with quality improvement (QI) initiatives, the sustainability of MU may be jeopardized.[13] Integration of MU and QI also is supported by a systematic review that highlights how IT has promoted QI through improved guideline adherence, enhanced disease surveillance, and reduced medication errors.[14] Finally, there is some evidence that quality gains can be driven by EHR champions who have an interest in QI and process redesign.[15]

Our study aimed to build on these findings by assessing whether particular approaches to supporting MU implementation are associated with successful MU Stage 1 demonstration, specifically having a QI team that leads MU implementation, an EHR super-user, or an MU nurse champion. Due to the growing emphasis on quality, as evidenced by Accountable Care Organizations and other initiatives, many health care organizations have established internal teams to oversee QI-related work. QI teams are often charged with identifying priorities for improving clinical performance as well as implementing and evaluating changes aimed at improving performance. A QI team, therefore, is well positioned to create alignment between MU and the identified priority areas within the practice setting. Furthermore, health care organizations commonly employ champions and super-users to engage and support their peers during health IT–related changes, such as MU. A small body of evidence suggests that these champions/super-users are key players in successful health IT implementation.[16–19]

Based on these findings, we expected that practice settings with QI teams leading MU implementation, those with EHR super-users, and those with MU nurse champions would have higher percentages of providers successfully demonstrating MU as compared to settings that did not employ these approaches. Our study is particularly relevant to ambulatory practices attempting to meet the increasingly challenging requirements of MU Stages 2 and 3, especially as services from regional extension centers may no longer be available to support such efforts. Our findings may suggest internal strategies that support MU effectively and therefore warrant financial investment.

OBJECTIVE

The purpose of this study was to assess whether having a QI team leading MU implementation, an EHR super-user, or a nurse champion for MU is positively associated with successful MU Stage 1 demonstration.

METHODS

Sample, Data Sources, and Measures

In February 2013, we administered a survey to medical directors, nurse managers, and practice managers in 47 ambulatory care clinics on the main campus of the UNC Health Care System (UNC HCS). We received complete responses from 37 clinics (response rate 79%). For

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each clinic, we obtained the numbers of total eligible providers and those demonstrating MU as of December 2012, which was the end of year 1 of MU Stage 1. These data were available via a dashboard that drew from the UNC HCS clinical data warehouse and administrative systems. Table 1 summarizes the study sample.

The dependent variable for our study was the percentage of eligible providers in each clinic demonstrating all Stage 1 MU objectives in December 2012. Stage 1 MU objectives included 14 required core objectives (eg, maintaining up-to-date medication lists for patients) and 5 menu objectives selected from a set of 10 options (eg, providing patient-specific educational materials).[20] Notably, MU demonstration as of December 2012 is a different measure than MU attestation status. According to CMS requirements, in the first year of Stage 1, Medicare-eligible providers had to demonstrate these objectives for a period of at least 90 days during the calendar year in order to "attest" for MU and receive the incentive payments. In this same period, Medicaid-eligible providers only needed to adopt EHR technology certified for the MU program in order to "attest" for incentive payments; demonstration of the core and menu objectives were required in subsequent years. However, within UNC HCS, all clinics operated under the same policies regarding how incentive payments were distributed. These internal policies required both Medicare- and Medicaid-eligible providers to demonstrate MU in order to receive incentive payments.

Dichotomous (yes/no) measures of our independent variables (ie, QI team leading MU implementation, EHR super-user, and nurse champion) were obtained via the survey described above. Regarding QI teams, we asked 2 questions: whether there is a QI team in the clinic, and, if so, whether the QI team "was responsible for leading MU implementation in the practice site." We expected that the QI team's association with MU success would be present when the team was directly involved with MU implementation. The survey did not capture information about the roles on the QI team in each clinic. Regarding champions, we asked separate questions about the presence of a physician champion and nursing champion. Because 35 of the 37 clinics (95%) reported having a physician champion, we excluded that variable from the model. The survey did not capture information about activities the

champion performed to promote MU. We defined "super-user" in the survey as "a person who uses [the EHR] to its fullest capacity" and indicated that this person could be either an MD or other health care professional. Notably, each clinic had access to the same types of MU support from UNC HCS (eg, training, process improvement coaching) and contributed financially to cover the costs of this support.

As control variables, we included (1) specialty, defined as either primary care or specialist, and (2) whether all clinical information was accessible in the EHR or some clinical information was accessible only via another system. Specialty accounts for the possibility that MU Stage 1 is more primary care–centric and therefore more easily attainable by providers in primary care settings. Accessibility of all clinical information through the EHR accounts for the possibility that demonstrating MU Stage 1 is more difficult for those who have to integrate multiple systems (not just the EHR) into their workflow. Notably, each clinic was using the same homegrown EHR, which had been implemented several years prior to the MU program and was then certified for MU. Presumably, clinics using multiple systems were doing so because the EHR could not capture and provide access to all necessary data in an efficient way.

Data Analysis

Outcome data (number of providers demonstrating MU Stage 1 objectives out of the total number of eligible providers) were only available aggregated at the clinic level. Furthermore, survey responses were at the clinic level. We analyzed our data using generalized estimating equation methods, with an independence working correlation matrix to account for clustering of outcomes within clinics and to appropriately weight the contribution from each clinic according to clinic size.[21] We first assessed associations between demonstration of MU Stage 1 and the presence of our 4 independent variables by applying separate logistic regression models for each variable of interest (analogous to conducting separate chi-square tests for each variable, but appropriately adjusted for clustering). We then fit a full model that simultaneously included all 4 variables of interest plus the 2 control variables. We considered $P < .05$ to indicate statistically significant associations, with no adjustments for multiple comparisons. We also explored the potential for nonadditive associations between combinations of our variables of interest and demonstration of MU by testing all 2-way interactions. We did this by adding 1 interaction at a time to the full model and testing the interaction term at the 0.1 level, to allow for reduced sensitivity for detecting interactions.

After performing the analyses for all MU eligible providers (ie, both Medicaid and Medicare), we repeated the process using only Medicare-eligible providers. We did so because, although UNC HCS used the same MU demonstration criteria for all eligible providers when allocating incentive payments, the CMS-defined MU objectives are different for Medicaid and Medicare providers in year 1 of Stage 1. If some clinics with Medicaid-eligible providers decided to follow the CMS-defined timeline rather than the UNC HCS timeline, such clinics may not have developed their MU implementation strategies (eg, QI team leading MU implementation) and formed their MU teams (eg, champions and super-users) according to the same schedule as those with Medicare-eligible providers. Therefore, our Medicare-only analysis would help detect whether relationships between the variables of interest and MU Stage 1 demonstration were due to the difference in the CMS-defined schedule for Medicare and Medicaid providers.

This study was reviewed by the UNC Office of Human Research Ethics (11-1032).

RESULTS

Of all eligible providers included in this study, 88.8% were demonstrating MU as of December 2012. Notably, only 1 of our independent

Table 1: Characteristics of practice settings in the study sample

Clinic Characteristics	Number of Clinics	Number of Eligible Providers	(%)Eligible Providers Demonstrating MU
Total	37	596	88.8
Practice type			
Primary care	4	124	96.0
Specialty	33	472	86.8
Practice size			
<5 eligible providers	4	12	66.7
5–20 eligible providers	23	217	92.2
>20 eligible providers	10	367	87.5
Incentive programs within the clinic			
Medicaid only	4	20	90.0
Medicare only	7	41	97.6
Both Medicaid and Medicare	26	535	88.0

Independent Variables	Unadjusted			Full Model		
	OR	95% CI	P-value	OR	95% CI	P-value
QI Team	0.59	(0.22-1.58)	0.294	0.75	(0.39-1.45)	0.394
QI Team Leads MU Implementation	3.92	(2.22-6.93)	<0.001	3.57	(1.83-6.96)	<0.001
Nurse Champion	1.94	(0.93-4.08)	0.079	0.99	(0.60-1.65)	0.983
EHR Super-user	2.18	(1.01-4.73)	0.048	0.91	(0.43-1.92)	0.812
Control Variables						
Specialty vs. Primary Care	0.28	(0.16-0.47)	<0.001	0.61	(0.31-1.19)	0.149
Clinical info maintained outside of EHR	0.41	(0.20-0.87)	0.021	0.41	(0.22-0.79)	0.008

Table 2: Estimated associations of QI team, nurse champion, and super-user with demonstrating meaningful use Stage 1

variables had a statistically significant association with MU Stage 1 demonstration: having a QI team that leads MU implementation (odds ratio, OR = 3.57, 95% CI, 1.83-6.96, $P < 0.001$, Table 2). One of our control variables, whether necessary clinical information is maintained outside of the EHR in other information systems, also was significant (OR = 0. 41, 95% CI, 0.22-0.79, P = .008). Some examples of information maintained outside the EHR included disease registries, clinical trials, and radiation therapy. None of the 2-way interaction terms was significant at the 0.1 level. Analyses of only the Medicare-eligible providers yielded similar statistically significant results: QI team leading MU implementation (OR = 2.97, 95% CI, 1.34-6.58, $P = .008$) and maintaining clinical information outside of the EHR (OR = 0.39, 95% CI, 0.17-0.89, P = .025) (results not shown).

DISCUSSION

Our findings indicate that having a QI team that leads MU implementation is significantly associated with MU Stage 1 demonstration. However, having neither a nurse MU champion nor an EHR super-user was significantly associated with MU demonstration. These findings suggest that linking MU implementation to QI efforts within the clinic, by having the QI team lead the MU implementation, could lead to more successful MU demonstration. QI teams provide leadership for QI activities in the clinic by establishing QI priorities and expectations (eg, targets, timelines). Therefore, aligning internal QI priorities with MU requirements could promote positive staff perceptions about the value and feasibility of MU and ultimately alleviate staff resistance to change, which is particularly important in small ambulatory practices.[22] The composition of clinic QI teams in this study may have varied in terms of size and roles represented; however, each had access to coaches, trainers, and analytics experts at the system level (UNC HCS). The best practices for operating such a model, and the cost of doing so, are not well studied and require future research.

The fact that having neither a nurse MU champion nor an EHR super-user was associated with successful MU Stage 1 demonstration runs contrary to the literature,[23–25] although this literature is still evolving. One possible explanation is that some clinics are appointing champions/super-users without providing the support needed to perform the role effectively.[26] Another possibility is that the individuals in the champion/super-user roles may not know how best to perform their role (eg, champions facilitating communication between organizational units; super-users training front-line users and troubleshooting problems).[27] Future research is needed to guide decisions about who should be an MU champion/super-user, what these individuals should do to promote MU success in their clinics, and how clinic leadership can best support their efforts.[26]

Maintaining some clinical information outside of the EHR, a control variable in our model, was significantly and negatively related to MU Stage 1 demonstration. This finding suggests that providers in clinics that maintain multiple systems for accessing clinical information may have more difficulty integrating MU within their workflow. Integrating information from disparate systems into workflow[28] and redesigning workflows to account for new information systems and drive QI[29,30] have long been recognized as challenges. The significant association between QI teams leading MU implementation and providers successfully demonstrating MU suggests a key strategy for ambulatory practices working toward challenging Stage 2 and Stage 3 MU objectives, as well as impending changes resulting from the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA). Although details regarding MACRA and its relationship to MU are currently unclear, the movement toward value-based care suggests a tighter relationship between QI and EHR usage for determining future Medicare payments.[31] Placing governance of EHR modifications under the auspices of the clinic's QI structure could facilitate efficient integration of QI priorities, information systems, and workflow redesign.

This study has some limitations. First, there may be practice-level factors (eg, leadership, culture) and provider-level characteristics (eg, age) that influence providers' MU Stage 1 demonstration, which were not measured in this study. However, our analysis accounted for clustering of providers within clinics to account for such unmeasured factors to some extent. Also, because responses to some key survey items (eg, having a physician champion) varied little in our data, we were unable to estimate potentially important associations. Finally, our study did not capture more detailed data about the champions/super-users, such as their level of experience with EHRs or peer perceptions about their performance as a champion/super-user. Therefore, it is possible that variation in the effectiveness of champions/super-users between the clinic settings contributed to a nonsignificant relationship with MU Stage 1 demonstration.

CONCLUSIONS

Our study supports the approach of aligning MU with QI efforts in the clinical setting by having the QI team lead MU implementation. Future research is needed to determine whether variations in the characteristics and performance of champions/super-users reveals that they are indeed an ingredient for success in some settings but not in others. Identifying such key ingredients for success is critically important as clinics face increasingly rigorous MU requirements in Stages 2 and 3 of the program.

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BRIEF COMMUNICATION

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CONFLICT OF INTERESTS

The authors have no conflicts to report.

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