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Effects of Implementing a Health Team Communication Redesign

Title:

Effects of Implementing a Health Team Communication Redesign on Hospital
Readmissions Within 30 Days

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Heading level 1:

Abstract

Background and Rationale: Poor communication between health team members can interfere with timely, coordinated preparation for hospital discharge. Research on daily bedside interprofessional health team rounds and nursing bedside shift handoff reports provide evidence that these strategies can improve communication.

Aims: To improve health team communication and collaboration about hospital discharge, improve patient experience of discharge measured by patient-reported quality of discharge teaching, readiness for discharge, and post-discharge coping difficulty, and reduce readmissions and Emergency Department (ED) visits post-discharge.

Methods: A two-sample pre- and post-intervention design provided baseline data for redesign of health team communication processes and comparison data for evaluation of the new process' impact. Health team members (n = 105[pre], n = 95[post]) from two surgical units of an academic medical

center in the midwestern United States provided data on discharge-related communication and collaboration. Patients (*n* = 413[pre], *n* = 191[post]) provided data on their discharge experience (quality of discharge teaching, readiness for discharge, post-discharge coping difficulty) and outcomes (readmissions, ED visits). Chi-square and *t* tests were used for unadjusted pre-and post-intervention comparisons. Logistic regression of readmissions with a matched pre or post intervention sample included adjustments for patient characteristics and hospitalization factors.

Results: Readmissions decreased from 18% to 12% (*p* < .001); ED visits decreased from 4.4% to 1.5% (*p* < .001). Changes in health team communication and collaboration and patients' experience of discharge were minimal.

Discussion: The targeted outcomes of readmission and ED visits improved after the health team communication process redesign. The process indicators did not improve; potential explanations include unmeasured hospital and unit discharge and other care process changes during the study timeframe.

Linking Evidence to Practice: Evidence from daily interprofessional team bedside rounding and bedside shift report studies were translated into a redesign of health team communication for discharge. These strategies support readmission reduction efforts.

Interprofessional communication underpins effective collaboration and coordination of patient care. Ineffective communication is a patient safety concern (The Joint Commission, 2017) and a primary cause of poor quality discharge care (Waring et al., 2014) that can result in delays in hospital discharge (Mustafa & Mahgoud, 2016). Such was the experience at a Magnet® recognized academic medical center in the midwestern United States (US). Siloed communication across disciplines resulted in lack of knowledge and agreement with the discharge plan of care. Clinical nurses expressed frustrations in achieving timely, coordinated discharge preparation. With active evidence-based practice and research mandates, two clinical nurse specialists organized a research team to study this interprofessional communication problem. Specifically, their goals were to understand the nature of the discharge-related communication problem, identify opportunities for improvement, use evidence-based practices to

redesign their health team communication process, and research the outcomes of the process improvement. This combined improvement, process innovation, and research project offered the opportunity for clinically-based nurses and physicians to jointly engage in interprofessional clinical research.

Heading level 1:

Background and Significance

Problems with hospital discharge are complex and inter-related, including fragmentation, confusion from multiple assigned roles, value placed on rapid pass-through, competing workload demands resulting in just-in-time teaching prior to hospital exit, and communication inefficiencies due to disciplinary silos of care (Banja, Eig, & Williams, 2007; Waring et al., 2014). Hospital discharge processes and post-discharge adverse outcomes that result in readmissions and emergency department (ED) visits have been targets of national health care reform, payment restructuring, and hospital-based quality improvement efforts (Kripalani, Theobald, Anctil, & Vasilevskis, 2014). The focus of these initiatives is communication and coordination from hospital to community rather than the hospital care team during the discharge preparation process.

Discharge preparation begins at (or before) hospital admission with the assessment and identification of discharge planning needs that often require health care team communication and coordination (Holland, Harris, Leibson, Pankratz, & Krichbaum, 2006). Poor communication about pending discharges leaves nurses to re-balance their multi-patient assignments causing delays while arrangements are made (Wrobleski, Joswiak, Dunn, Maxson, & Holland, 2014). Lack of time for adequate teaching can leave patients feeling unprepared for discharge (Blinded, 2015), ill-prepared for coping at home after discharge, and at risk for readmission (La Manna, Bushy, & Gammonley, 2018; Blinded, 2007).

Health team communication has received considerable attention as a critical factor in quality care and patient outcomes (American Hospital Association, 2017). Daily health team rounds at the patient bedside (hereafter referred to as Team Bedside Rounds [TBR]) by the medical team

with registered nurses (RNs) and other professionals, and RN-to-RN bedside shift handoff reports (referred to as BSR) are mechanisms for direct communication between health team members and with patients and families to assure common goals, proactive planning, and consistent information exchange. The evidence supporting the use of TBR comes from Canadian and United States (US) reports of improved communication and collaboration following implementation of daily interprofessional team rounds (Hastings, Suter, Bloom, & Sharma, 2016; Henkin et al., 2016; Narasimhan, Eisen, Mahoney, Acerra, & Rosen, 2006; O'Leary et al., 2011; Pritts & Hiller, 2014; Zwarenstein, Goldman, & Reeves, 2009). Specific to hospital discharge, patient and family engagement in communication with the health team has been advocated in US guidelines for "IDEAL" discharge planning (Agency for Healthcare Research and Quality, 2017).

BSR involves communication between nurses and with patients in the time between TBR to promote continuity of care at change of nursing shifts. BSR provides opportunities for improved patient relationships, patient empowerment, family inclusion, error reduction, and time and cost savings. Nurses value shift change handoffs for collaboration with nurse colleagues and care coordination that improves workflow, patient-centered care, and patient and nurse satisfaction. Patients value BSR as an opportunity to access to their health information and participate in care decisions (Gregory, Tan, Tilrico, Edwardson, & Gamm, 2014; Kitson, Athlin, Elliott, & Cant, 2014).

Heading level 1:

Purpose and Aims

The purpose of the study was to determine if a redesigned health team communication process related to hospital discharge improves communication and collaboration between nurses and physicians (aim 1), patient experience of discharge care as measured by quality of discharge teaching, readiness for discharge, and post-discharge coping difficulty (aim 2), and the rate of readmissions and ED visits within 30 days post-discharge (aim 3).

Heading level 1:

Theoretical Framework

Meleis' Transitions Theory (Meleis, Sawyer, Im, Messias, & Schumacher, 2000) provided a guiding perspective for the study design. In a transitional event such as the transition home following hospitalization, the nature of the transition, conditions that facilitate or inhibit the transition, and nursing therapeutic practices all impact patterns of response to the transition. For this study, hospitalization factors (e.g., length of stay, prior hospitalization, and referral to home health care at discharge) represent the nature of the transition. Facilitators and inhibitors include patient characteristics associated with transitional outcomes (e.g., age, sex, race). Patterns of response at discharge include patient perception of quality of discharge teaching and patient, nurse, and physician perception of discharge readiness. Post-discharge, the patterns of response of interest are post-discharge coping difficulty and return to the hospital (i.e., readmission or ED visits) within 30 days after discharge. The concept of nursing therapeutics has been extended to team therapeutics and refers to team communication about discharge preparation.

Heading level 1:

Methods

Heading level 2:

Study Design

The study was a two group pre- and post-intervention design. Data collection occurred in 4 phases: Pre-intervention phases 1 and 2 informed the communication process redesign and provided pre-intervention measurements of process and outcome variables. In post-intervention phase 3 and 4, we collected the same variables as phases 1 and 2 with a separate patient sample. Research measures and study timeline for each phase are presented in Table 1.

Insert Table 1 about here

Heading level 2:

Sample and Setting

For aim 1, the sample comprised inpatient physicians (attending [senior] and resident [post-graduate in training] MDs) and RNs from two adult surgical units (surgical oncology and mixed surgical) of a 536-bed academic medical center. For aims 2 and 3, the sample consisted of patients from the two units who were: 18+ years of age, English-speaking, and discharged home without hospice care. Decisionally-incapacitated patients were excluded. The convenience sample was selected based on research team availability for conducting informed consent and voluntary participation. The estimated sample size needed for logistic regression analysis of readmission (aim 3) was 310 patients at 80% power, $p < .05$, at an odds ratio of < 0.70 (Faul, Erdfelder, Lang, & Buchner, 2007).

On the study units, the medical staff work in teams of attending MDs, resident MDs, and medical students, supported by advanced practice nurses assigned to the teams. Nursing staff consist of clinical RNs supported by their managers and a unit-based clinical nurse specialist. For discharge, case managers assist with care coordination and patient placements after discharge. Readmission reduction was a priority initiative within the study hospital.

Heading level 2:

Intervention

The intervention was a redesigned health team communication process between MDs and RNs, and with patients and families. Pre-intervention data and evidence-based practices identified through review of literature formed the basis for a decision to structure a redesigned communication process to include daily TBR and BSR. The overall goal was to include the triad of MD, RN, and patient in joint communications with a focus on discharge goals and patient activities necessary for discharge. To support the TBR and BSR processes, tools for improving communication were

drawn from the Team Strategies and Tools to Enhance Performance and Patient Safety program, "an evidence-based teamwork system to improve communication and teamwork skills among health care professionals" (TeamSTEPPS®, 2017). These tools were structural enhancements to the TBR and BSR processes: (a) "briefing checklists" for use in TBR and BSR and (b) a "whiteboard" checklist in the patient room to cue patients (and their families) about the discharge-related goals. A detailed description of the development of the intervention using the TeamSTEPPS® process is reported elsewhere (Blinded, 2018).

Team education supported development in the new team communication processes and use of the tools. A voiced-over Powerpoint® presentation with an embedded link to a video demonstration of an exemplar TBR and BSR were presented at standing physician meetings and nursing unit training sessions. A link was also emailed to all physicians and nurses. In the first two weeks after launch of the redesigned processes, the clinical nurse specialists leading the research team conducted additional training sessions and were available on the units for coaching and support.

Heading level 2:

Measures

Heading level 3:

Discharge Communication Survey. Data on discharge communication among providers were collected using a network approach (Gittell, 2011). We asked each RN and MD to respond to three separate questions about their communication with other health team members: (a) how frequently they communicated on the day of discharge, (b) how frequently they communicated on the day before discharge, and (c) the amount of information received. Questions 1 and 2 used a 0 - 10 scale [0 = *never*, 10 = *always*]. Question 3 used a –5 to +5 scale [–5 = *too little*, +5 = *too much*].

Heading level 3:

RN-MD collaboration. The Collaborative Behavior Scale (CBS; Stichler, 1990) is a 20-item self-report measure of perceptions of RN-MD

collaborative behaviors in their practice environment, with parallel forms for RN and MD respondents. The CBS uses a 4-point Likert-type scale (1 = *rarely*, to 5 = *nearly always*) to generate a total score. Reliability estimates in prior studies exceeded .90 (Almost & Laschinger, 2002; King & Lee, 1994).

Heading level 3:

Quality of Discharge Teaching Scale (QDTS). The QDTS (Blinded, 2007) is a patient-reported measure, completed on the discharge day, of the quality of discharge teaching received from nurses over the course of hospitalization. Higher scores on the 0 - 10 point scaling format reflect a greater amount of discharge-related informational content received (6 items) and higher quality of delivery of teaching (12 items). Prior testing indicated acceptable reliability estimates (α = .85 - .93), with "delivery of teaching" associated with patient-reported readiness for discharge (β = .54, *p* < .05; Blinded, 2007). A reduced "delivery" subscale of four items (explaining 93% of the longer form's variance) was used for this study; patients rated their nurses on how well they (a) listened to the patients concerns, (b) taught in a way patient liked, (c) gave information at times that were good for the patient, (d) helped the patient feel confident about caring for him or herself at home.

Heading level 3:

Readiness for Hospital Discharge Scale (RHDS). The 8-item RHDS was completed by patients (PT-RHDS), nurses (RN-RHDS) and physicians (MD-RHDS) on the day of hospital discharge. Higher scores on the 0 - 10 scaling format indicate greater discharge readiness. The 8 items were derived from the original 21-item scale (2 items from 4 subscales: Personal status, Knowledge, Perceived Coping Ability, Expected Support [Blinded, 2006]); PT- and RN-RHDS and have been previously tested with adult medical-surgical patients (Blinded, 2014, Blinded, 2018). Reliability was acceptable (α > .80), factor analyses supported construct validity, and predictive validity with post-discharge coping difficulty and readmission or ED use within 30 days was evident. (Blinded, 2007, 2014). The MD-RHDS had not been previously used in research.

Heading level 3:

Post-Discharge Coping Difficulty Scale (PDCDS). The 10-item PDCDS uses the same scaling format as the RHDS. Higher scores represent greater difficulty with coping at home after hospital discharge. Exploratory factor analysis indicated a single dominant factor. Reliability for a prior adult sample was 0.87 (Blinded, 2007). PDCDS data were collected by telephone interview at two weeks post-discharge.

Heading level 3:

Hospital readmissions and ED visits. ED visits and readmissions within 30 days post-discharge were extracted from electronic health records (EHR). Because EHRs include only same-hospital readmissions and ED visits, we also collected this information during a telephone follow-up interview at two weeks post-discharge. Readmissions and ED visits were coded as dichotomous variables: 1 = *one or more occurrences of a readmission* or ED visit by patient self-report or documented in the EHR, 0 = *no occurrences*.

Heading level 3:

Patient characteristics. Numerous patient characteristics have been associated with readmission (Kansagara, 2011). Demographics (e.g., age, sex, race), and hospitalization factors (previous hospitalization, length of stay, home health referral) were collected for use in sample description and matching for comparative analysis.

Heading level 2:

Ethical Issues and Approval

The study was approved by the Institutional Review Board at the study site. Nurses from the study units who were on the research team completed human subject's protection training and obtained informed consents. These nurses did not consent patients to whom they were assigned for patient care.

Heading level 2:

Procedures

Heading level 3:

Pre-intervention. We collected anonymous data from health team members on the Discharge Communication Survey and CBS using a web-based survey distributed via email and paper forms available on nursing units and at interdisciplinary grand rounds. Paper forms were returned to a locked box on each unit to assure anonymity of responses.

Eligible patients were consented and enrolled into the study prior to or on the day of discharge. A study ID number was assigned to each patient and appeared on all forms. Forms were placed in predetermined locations to be available to patients, nurses, and physicians on the day of discharge. Reminder notes cued nurses to have patients complete RHDS and QDTS forms prior to discharge and place in a sealed envelope in the unit's locked study box. The discharging RN and MD also completed their RHDS forms on the day of discharge.

PDCDS and ED visits or readmissions were obtained via telephone follow-up interviews 2 to 3 weeks post-discharge. Medical record data on readmissions, ED visits, and patient characteristics were obtained from the hospital information systems department after 30 days post-discharge.

Heading level 3:

Post-intervention. After training and implementation of the new communication processes into operational workflow, a 3-month lag before phase 3 allowed for the learning curve and normalization within unit care processes. Post-intervention data collection procedures replicated pre-intervention.

Heading level 2:

Analysis Methods

We began the analysis with unadjusted two-group pre- and post-intervention comparisons of outcomes (readmissions and ED visits), patient discharge experience (QDTS, RHDS, PDCDS), and health team

communication variables (communication questions and CBS). Our approach was to first look at the outcomes and then determine changes in the upstream patient experience and team communication factors that could influence a change in outcomes. *T* tests for independent samples were used for interval-level variables, and chi-square for nominal-level variables.

To more effectively investigate the impact of the redesigned communication process on the outcomes, we used a Mahalonobis minimum distance matching process (Guo & Fraser, 2015) to match post-intervention patients 1:1 with pre-intervention patients on the three demographic and three hospitalization factors, thereby adjusting for factors that might introduce bias into comparisons of the two separate non-random sample groups. The Mahalonobis distance matching process finds the best match based on the combination of patient characteristic variables, such that the distances between each index patient and their match are minimized, though not exact on some variables. Logistic regression, fully adjusted for the three demographic and three hospitalization variables, was used for analysis of the occurrence of a readmission or ED visit with matched pre-and post-intervention groups. Analyses were conducted in STATA 14.0 (StataCorp LLC, College Station, TX, USA).

Heading level 1:

Results

The samples for the study consisted of RNs, MDs, and patients. Pre-intervention, 56 RNs and 49 MDs completed the communication and CBS surveys; 72 RNs and 23 MDs completed surveys post-intervention. Data were collected from 413 patients pre-intervention and 191 patients post-intervention. Comparisons between pre- and post-intervention patient characteristics revealed a higher percentage of male patients pre-intervention, and nearly double the rate of discharge with home health services post-intervention (Table 2). For the matched sample process, 188 of the original 191 post-intervention patients were able to be matched with a pre-intervention patient.

Insert Table 2 about here

Unadjusted comparisons of pre- and post-intervention groups are

presented in Table 3. The 30-day readmission rate was significantly lower post-intervention, by 6.4 percentage points (pp). Though not statistically significant, ED visits also declined post-intervention by 2.8 pp. In the adjusted comparison with matched samples, the reduction in readmissions (Figure 1) was similar (readmissions declined from 18.2% to 12.1%, *p* < .001; ED visits from 4.4% to 1.5%, *p* < .001).

Table 3 and Figure 1 about here

Seeking possible explanations for this marked reduction, we compared patient experience measures and health team communication and collaboration pre- and post-intervention (Table 3). There were no statistically significant improvements in QDTS, PT- and RN-RHDS, or PDCDS. Overall QDTS was rated very high (means = 9.3 - 9.5 out of 10). A small decrease (0.2 on the 0-10 scale) in MD-RHDS was observed. While mean PT-, RN-, MD-RHDS scores were similar, correlations between them were very low (*r* = .07 to .11) pre-intervention and did not improve (*r* = -.12 to .15) post-intervention. PDCDS scores indicated low coping difficulty pre- and post-intervention (2.4 and 2.2 on a 0 - 10 scale).

Changes in health team communication process was reported by MDs but not by RNs. Post-intervention, MDs reported more frequent communication with other MDs and with nurses on, but not prior to, the day of discharge. MDs also reported slightly higher collaboration scores post-intervention, and more collaboration with nurses than nurses reported with MDs. (Table 3).

Heading level 1:

Discussion

Results revealed a marked decrease in readmissions and ED visits from pre- to post-implementation of the redesigned communication process. Health team communication factors, patient experience factors, and patient characteristics were evaluated for their possible contribution to the reduction. The few small differences in health team communication and patient experience variables do not provide an explanation of the mechanism underlying the reduction in post-discharge utilization, though these variables have been associated with post-discharge utilization in

prior studies (Blinded, 2007, 2011). Other unmeasured factors such as ongoing refinements in care coordination processes may have contributed to the results.

Differences were noted in the percentage of male patients, hospitalizations in the past 90 days and use of home health services post-discharge between pre- and post-intervention samples. When analysis using the matched sample controlled for these sample differences, the substantial reduction in readmissions remained, suggesting that the intervention, and not these differences in patient characteristics, contributed to the reduction.

A main limitation of the study was a lack of a contemporaneous control group, which does not allow us to rule out the contribution of other efforts within the study units and the hospital to the readmission decline. Other limitations include the use of only two nursing units in a large academic medical center; results may differ in other settings. The prolonged study period was a result of operational decisions to have clinical nurses consent patients, slowing the patient recruitment process. Competing demands on nursing time contributed to a smaller post-intervention patient sample. Fewer physicians participated post-intervention, possibly related to repetition of measurements and loss of physician champions. With repeated reminders, nurse participation increased post-intervention. These differences could have affected patient sample selection and completeness of data collection. Barriers to implementation of the process redesign have previously been reported (Blinded, 2016).

Our approach to evaluating changes in outcomes and potential contributing factors may be useful in other local studies where sample sizes are small, and controls are insufficient for causal inference. While we did not find concurrent process improvements despite finding intervention effects on outcomes, the use of a matched pre- and post-intervention sample improved our confidence in the findings.

Heading level 1:

Implications for Practice

In this study, we found that the evidence-based practices of TBR

and BSR, when included in a redesigned health team communication process with a focus on improved discharge communication, may contribute to readmission reduction. The idea of focusing daily rounding on joint communication between patients, nurses, and the physician team about progression and preparation for discharge reshapes goals for daily team rounds, setting the stage for the desired outcome of timely, coordinated discharge and subsequent readmission avoidance.

The study results concerning poor agreement between patients, nurses, and physicians on discharge readiness suggests a lack of direct communication on this topic. Adding discharge readiness assessment to TBR and BSR procedures would create an opportunity for the patient and care team to partner in identifying deficiencies in discharge readiness that warrant anticipatory, compensatory, or corrective interventions prior to discharge, with the goal of averting post-discharge problems and health care utilization.

Please gray-box Linking Evidence to Action

And add the three-links symbol before the title

Heading level 1:

Linking Evidence to Practice

- Daily bedside rounds by the health care team improves communication and collaboration among interprofessional team members.
- Nurse-to-nurse shift handoff report conducted at the bedside improves relationships with patients, empowers patients and families, reduces errors, and fosters coordination and collaboration.
- Designing daily team bedside rounds to focus on communication about discharge between the triad of physician, nurse and patient/family can contribute to reducing readmissions and ED visits.
- Patients, nurses, and physicians have different perspectives on readiness for discharge that need to be communicated and aligned.

Heading level 1:

Conclusions

A combined improvement, process innovation, and research approach was a useful method for engaging the health team in understanding the clinical problem of health team communication about discharge, redesigning the communication process with a specific focus on progress toward discharge, and evaluating the impact on patient outcomes. A hallmark of the approach was engagement of the interprofessional team in defining the scope of the problem and the redesign of the structure and content of their rounding processes. Results of the evaluation suggest the possibility that the redesigned health team process contributed to readmission reduction in the two participating units.

Heading level 2:

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Table 1.

Study Timeline

Study phases	Research activities	Dates
Pre-intervention		
Phase 1	Data collection: RNs and MDs • Discharge Communication Survey • Collaborative Behavior Scale	3/25/2013- 4/30/2013
Phase 2	Data collection: patients • Quality of Discharge Teaching Scale • Readiness for Hospital Discharge Scale • Post-Discharge Coping Difficulty Scale • Patient characteristics • Readmissions and ED visits Data Collection: RNs and MDs • Readiness for Hospital Discharge Scale	5/1/2013-5/30- 2014
Intervention		
Evidence Review Intervention Design	Review of Phase 1 and 2 data and literature review Intervention components: • Daily Interprofessional Team Bedside Rounding	6/24/2014- 3/1/2015

Training		o Briefing checklist	
		• Nurse Bedside Shift Report (handoff)	
		o Briefing checklist	
		• In-room communication whiteboard	
		Physician standing meetings	
		Voiced Powerpoint® presentation with embedded video demonstration	
		Nursing unit inservice training	
		Independent learning via learning platform	
Implementation		Unit-wide launch of intervention.	
		Coaching by clinical nurse specialists / lead researchers	
Post-intervention			
Phase 3		(same as Phase 2)	6/1/2015-
		Data collection: Patients	4/30/2016
		• Quality of Discharge Teaching Scale	
		• Readiness for Hospital Discharge Scale	
		• Post-Discharge Coping Difficulty Scale	
		• Patient characteristics	
		• Readmissions and ED visits	
		Data Collection: RNs and MDs	
		• Readiness for Hospital Discharge Scale	

Phase 4	(same as Phase 1)	6/1/2016-
	Data collection: RNs and MDs	6/30/2016
	- Discharge Communication Survey - Collaborative Behavior Scale	

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Table 2.

Sample Characteristics

Variable	Pre-intervention n = 413	Post-intervention N = 191	p value:
Age	53.9	55.6	.23
Male	58.6%	41.4%	.000
Non-white	16.2%	21.7%	.08
Prior hospitalization 90 days	8.7%	12.0%	.09
LOS	7.0d	6.3d	.08
Discharge to home health	10.9%	20.5%	.002

Table 3.

Comparison of Measures Pre- and Post-Intervention

	Pre-intervention n = 413	Post-intervention n = 191	p value
Primary outcomes			
Readmission n (%)	76 (18.4)	23 (12.0)	.05
ED visit n (%)	27 (6.5)	7 (3.7)	.15
Patient discharge experience measures			
Quality of discharge teaching mean (sd)	9.3 (1.1)	9.5 (1.0)	.16
Readiness for discharge: PT mean (sd)	8.4 (1.2)	8.5 (1.1)	.30
RN	7.8 (1.1)	7.9 (1.1)	.51
MD	8.0 (1.2)	7.7 (0.9)	.002
Post-discharge coping difficulty mean (sd)	2.4 (1.7)	2.2 (1.6)	.61
Health team communication*	n = 49 MDs N = 56 RNs	n = 23 MDs n = 72 RNs	
#Discharge communication question 1 (frequency on day of discharge			.05
MD to MD mean (sd)	8.9 (1.8)	9.7 (1.0)	.06
MD to RN	6.6 (2.6)	7.7 (2.4)	.93
RN to MD	6.4 (2.7)	6.3 (2.8)	.58
RN to RN	8.8 (1.7)	8.8 (2.2)	
#Discharge communication question 2 (frequency on day before discharge)			.25
		9.8 (0.8)	.26
MD to MD mean (sd)	9.4 (1.6)	8.4 (2.1)	.47
MD to RN	7.7 (2.6)	6.8 (2.6)	.35
RN to MD	7.1 (2.6)	8.8 (2.1)	
RN to RN	9.1 (1.7)		.25
#Discharge communication question 3 (amount of communication)		-0.3 (1.0)	.14
		-0.5 (1.0)	.37
MD to MD mean (sd)	-0.6 (1.1)	-0.9 (2.0)	.34
MD to RN	-1.0 (1.4)	0.2 (2.0)	

RN to MD	-1.1 (1.7)		
RN to RN	0.7 (1.7)		
Collaborative Behavior Scale mean (sd)			
- MD	3.1 (0.5)	3.4 (0.6)	.05
- RN	2.5 (0.6)	2.6 (0.7)	.67

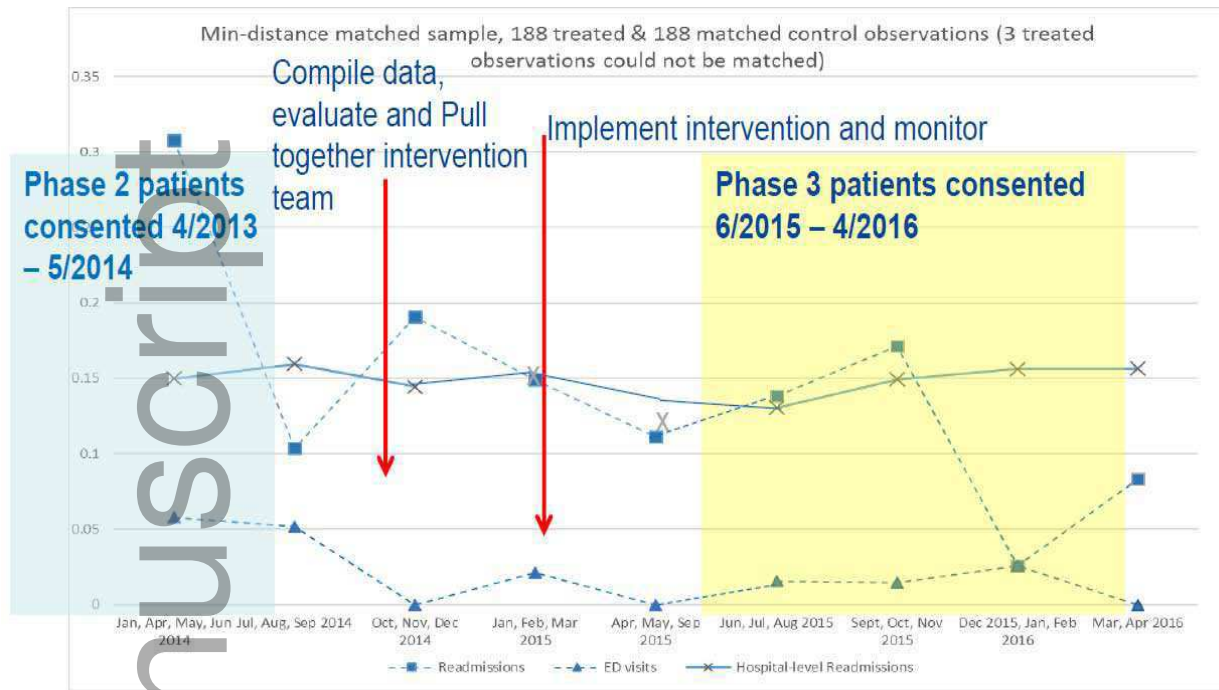*Reported as perception of communication by respondent (MD or RN) with other MDs or RNs.

Figure 1. Matched sample analysis of differences in readmissions.