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Report of a pilot study of quality improvement in nursing homes led by healthcare aides

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Abstract

Objective: Healthcare aides (unregulated care providers), who deliver the majority of direct care in Canadian nursing homes, have high levels of emotional exhaustion and cynicism. However, they also have remarkably high levels of job efficacy. Strategies to empower this workforce may reduce cynicism and draw on their high levels of job efficacy. The primary objective of this study was to act as proof-of-principle to determine whether quality improvement teams led by healthcare aides could be established in nursing homes and function on a daily basis.

Methods: This study was a pilot test of a complex intervention using a mixed methods approach. We used a combination of education, networking and coaching to engage staff teams in quality improvement in 1 of 3 areas (pain control, skin care or behaviour management). We measured healthcare aides' quality of work life, informal communication and research (best practice) use before and after the intervention. To understand the effect of quality of care at the bedside we used risk-adjusted quality indicators derived from Resident Assessment Instrument - Minimum Data Set 2.0 data.

Results: A total of 10 teams participated in the intervention. At least 70% of the teams succeeded in learning and applying the improvement model and methods for local measurement. For 50% of the teams, data showed measurable improvement in the clinical areas. There were no significant differences between pre and post measures of survey variables.

Conclusions: We have demonstrated the ability of healthcare aides to engage in quality improvement initiatives at the bedside in a collaborative environment and advance our results as an important contribution to person-centered healthcare.

Keywords

Burnout, healthcare aides, long-term care, nursing homes, person-centered medicine, pilot test, quality indicators, quality improvement, quality of work life, SCOPE

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Introduction

Safer Care for Older Persons (in residential) Environments (SCOPE) is a component of Translating Research in Elder Care (TREC), a longitudinal research program focused in the 3 Canadian prairie provinces. TREC seeks to discover modifiable aspects of organizational context in nursing homes that could lead to increased use of best practices and improvement in quality and safety [1-3]. The program has established a longitudinal monitoring system with a representative sample of more than 40 residential long term care (LTC) facilities (nursing homes). Using this monitoring system and its validated instruments, we assess organizational context, self-reported use of best practices and quality of work life (e.g., job satisfaction, burnout). The monitoring system also continuously captures the Resident Assessment Instrument – Minimum Data Set 2.0 (RAI-MDS 2.0) data from these nursing homes and links these and the aforementioned survey data at the unit level. Our RAI-MDS data starts in 2007; we carried out our survey on 2 occasions, one year apart, starting in 2008. Early examination of the survey data indicated that healthcare aides, unregulated healthcare providers who deliver 80% of the direct care in Canadian nursing homes, have high degrees of emotional exhaustion and cynicism. However, as a group they also have remarkably high levels of job efficacy. These data were collected with the well validated Maslach Burnout Inventory [4,5].

The research team, in considering these findings from the larger TREC study, thought that a strategy to empower the healthcare aide workforce might well reduce cynicism and tap into the high levels of job efficacy. Members of the SCOPE (Safer Care for Older Persons in Residential Care

Environments) research team had many years of experience with quality improvement (QI) initiatives in the acute care sector. In particular, one team member (PN) co-founded *Safer Healthcare Now!*, the Canadian version of the 100,000 Lives Campaign in the USA [6,7]. Both of these employed collaborative tools and methods developed by the Institute for Health Improvement in the mid-1990s [8]. After discussion, the TREC team, comprised of researchers and decision-makers, sought funding for a pilot project to investigate whether developing QI teams led by healthcare aides could be employed in nursing homes to improve care outcomes of residents. We approached Health Canada, which at the time had an initiative on the healthcare workforce and they agreed to fund the pilot project (CA# 6804-15-2009/9180076).

The pilot project established QI teams in 10 units in 7 nursing homes in Western Canada (Alberta and British Columbia). These teams were designed to be led by healthcare aides and to have 4 to 6 members. SCOPE research staff facilitated the nursing home QI teams to acquire skills and knowledge to carry out rapid cycle changes using the Plan-Do-Study-Act (PDSA) method to test for change at the bedside. Research staff using day-to-day troubleshooting and scheduled monthly teleconferences facilitated the learning of the tools, the ability to undertake local measurement, understanding of RAI-MDS reports and formation of networks across the 10 units so that teams could learn from each other. Each team was required to have a senior sponsor at the level of a Director of Care or higher. The role of this individual was to support the QI team, provide required resources, ensure barriers were removed and celebrate successes with senior management [9].

The literature concerning collaboratives and more specifically, QI initiatives in nursing homes, has few reports of teams being led by healthcare aides. We located one recent study in which unregulated staff were involved as members of their local QI teams [10]. Teams reported success in achieving their primary QI outcomes [10]. Indeed, healthcare aides play a pivotal role in the healthcare team. They are instrumental to the quality and safety of care in LTC facilities. They are the staff most likely to observe, interpret and respond to residents' care needs on a daily basis [11,12]. Because residents' care is significantly influenced by what healthcare aides do and how they do it, their decisions and actions have a direct impact on the care that residents receive [12]. Older adults with cognitive impairment (e.g., dementia) are dependent on their providers to deliver increasingly complex care, care that often takes a toll on healthcare aides. The relationship between healthcare aides' work and burnout is well documented [13-15]. Strategies such as empowering work teams can have a positive impact on staff performance and resident care [16,17]. Healthcare aides who feel empowered have reported experiencing less burnout and feel more committed to and satisfied with their jobs [18]. Staff engagement (e.g., the involvement and commitment of staff) and initiatives aimed at improving communication among nursing home staff have been associated with improved quality of care [19-22]. Use of best practices (e.g., clinical practice guidelines) has also been shown to improve the quality of care (both the process and outcome of care) [23]. Successfully using best practices involves the application of complex knowledge and requires teamwork and communication among staff [24]. While these processes are complex, healthcare aides have demonstrated their ability to implement best practice knowledge into their care [24].

The primary objective of the pilot study was to act as proof-of-principle, that is, to determine the feasibility of implementing an intervention designed to engage front line staff (primarily healthcare aides) in using QI methods to integrate evidence-based (best) practice into resident care in nursing homes. In particular, we were interested in determining the feasibility of implementing QI teams in nursing homes given the real constraints of small numbers of staff, traditional decision-making hierarchies and the implied cost to nursing homes. A number of secondary objectives were formulated as research questions. Although the pilot study was underpowered to address all of these, developing the necessary methods to evaluate them was an important part of the pilot study:

1. What were the effects of the project on quality of work life of the healthcare aides on the intervention units and across their facility? That is, did implementing the QI teams have an effect on quality of work life and, if so, could we assess it?

2. Did implementing the QI teams enhance communication among staff delivering care at the bedside?

3. Did the development of the QI teams have an effect on the RAI-MDS quality indicators associated with specific clinical areas chosen for improvement?

4. Did the teams apply the QI tools to other work?

Methods

The University of Alberta Research Ethics Board and the Interior Health region of BC research ethics board approved the study protocol (#Pro00012517). Recruitment of facilities to participate in the SCOPE pilot study was complex. First, a convenience sample of possible nursing homes in Alberta and British Columbia (BC) was identified in consultation with senior decision-makers. In each of these a senior decision-maker was approached. The purpose of SCOPE was explained and the projected workload was outlined [9]. This work required, at a minimum, a monthly teleconference of about one hour at which at least 2 team members were present, regular *huddles* (informal on the run meetings) of the unit team members, time for the team members to meet with senior decision-makers, support for 2 or more team members (at least one being a healthcare aide) to attend to face-to-face meetings which occurred 4 times over the course of the intervention and some free time for team members to

prepare data and presentations for the various meetings [9]. The research team estimated that this required at least 5% of a full-time equivalent healthcare aide position being released for SCOPE work over the projected 12 months of the SCOPE initiative [9]. We previously determined that in almost all cases the nursing homes would be unable to backfill positions due to shortages of qualified casual staff. The research team offered a modest grant of $3,000 Canadian to help offset the costs to the facilities. Over 2 months, the research team, working closely with its decision-makers, recruited 7 nursing homes in Alberta and BC.

Each nursing home's Director of Care decided which units would undertake the intervention and who the team members would be with the *a priori* requirement that at least 2 healthcare aides be on the team and one of these would function as leader. A senior sponsor was also named. Two larger nursing homes decided to establish more than one team and 2 smaller nursing homes combined units to form one team.

To decide on the clinical areas of focus for the QI teams, the research team undertook a consensus exercise among a convenience sample of decision-makers and healthcare aides who were involved in the larger TREC project, as well as registered nurses/care coordinators and managers/educators not involved in either TREC or SCOPE projects. We have reported on this exercise [25]. Briefly, the process consisted of establishing a list of those clinical areas for which there were risk-adjusted RAI-MDS quality indicators. There were 9 clinical areas on the list. These were ranked by the group on relevance to healthcare aide practice and being amenable to improvement through healthcare aide bedside practice. There was strong concordance between the rankings of decision-makers and healthcare aides. The top 3 areas, skincare, management of behavioral issues and pain control, were presented to the QI teams and their senior sponsors and each of the teams selected one of these areas for their QI work.

To carry out the intervention the research team hired a small staff that included a project manager, quality advisor, quality consultant and a research assistant. The project manager had extensive experience working in quality and safety including experience with the *Safer Healthcare Now!* initiative in Canada. She was assisted by a quality advisor who had quality experience in Alberta and whose role was to liaise regularly with teams and help plan various learning activities. A senior member of the *Safer Healthcare Now!* initiative agreed to act as a quality consultant to this team.

The research team and staff then planned the details of the SCOPE intervention. It was designed around a set of core principles:

- To acknowledge that healthcare aides are expert care givers at the frontline in residential care settings

- To empower healthcare aides to contribute and execute change ideas that could lead to an improved quality of care for residents and their families and enhance quality of work life for themselves

- To appreciate the realities of working life of the healthcare aides and to provide information and facilitation that would work within that context

- To regularly monitor progress of the teams and assess learning needs so that education and coaching support could be adjusted to meet the needs of the teams in order to maximise their effectiveness

- To work with senior leaders to ensure they would support the frontline teams during the SCOPE work

Guided by these principles, their knowledge of and experience in previous collaboratives including *Safer Healthcare Now!*, the SCOPE research team, including staff, developed a critical time path for the pilot (see Table 1).

The SCOPE research team and staff then developed a detailed work plan. SCOPE was envisioned as a complex intervention based on a model of facilitation [26-28]. It used a combination of education, networking and coaching to meet its objectives and involves active support by the SCOPE research team and staff. In particular, there would have to be ongoing day-to-day care and attention to the processes by the SCOPE research associate and quality advisor. It was similar to a facilitation approach midway between what Seers and colleagues describe as a continuum of facilitation with an instrumental task focused *technical* facilitation at one end and a highly *engaged* facilitation requiring higher intensity levels than we believe are possible to sustain in the nursing home environment in Canada at the other end [28].

Data collection

While SCOPE staff completed the work plan and began to prepare the teams for the first learning session, the research team focused on evaluation. It was clear from the objectives that a mixed method evaluation was necessary. The qualitative component involved detailed field notes from staff. The quality advisor and project manager diarized their impressions on a daily basis and these records were securely stored at the research offices for later analysis using qualitative methods. The results of this analysis were combined with simple measures of engagement in the SCOPE process such as the submission of monthly reports, attendance at learning sessions, attendance at telephone conferences, QI team-initiated calls to SCOPE staff and debriefings of senior sponsors at the learning sessions. We envisioned that these data would allow us to address the primary question – 'Is it feasible to mount a definitive intervention study to evaluate the effect of the SCOPE facilitation intervention on the care of residents and the quality of work life of frontline staff?'

Table 1 SCOPE Timeline

2010				2011				2012			
Q1	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Planning phase											
		Team & facility recruitment									
			Learning session 1 & action period 1	Learning session 2 & action period 2	Provincial Team meetings		Closing congress				Dissemination QI and survey results
		Time 1 data collection§									
						Time 2 data collection*					
							RAI-MDS data+				

Note. Q1= January-March; Q2=April-June; Q3=July-September; Q4=October-December
Note. Grey shading=QI arm; white shading=Research arm
§Time 1 data collection=SCOPE survey, facility survey completed by administrators (e.g., facility characteristics), staffing data
*Time 2 data collection= SCOPE survey, facility survey
+Resident Assessment Instrument - Minimum Data Set 2.0 (RAI-MDS 2.0) data- Acquired quarterly from April 1, 2009-December 31, 2013.

Quantitative data came from several sources. First, prior to running learning session 1 and at the end of the SCOPE pilot, we collected survey data from healthcare aides using the TREC survey. We have reported on this survey several times and have shown that it has acceptable psychometric properties and that several variables and indices can be aggregated to unit and facility levels [29-32]. For the SCOPE pilot project, we were particularly interested in several indices from the TREC survey:

- Quality of work life measures which included job satisfaction, burnout (specifically emotional exhaustion, cynicism, job efficacy as measured by the Maslach Burnout Inventory) and health status assessed using the SF-8™ Health Survey [33, 34].

- Measures of informal communication between healthcare aides and the rest of the staff in nursing homes – one of the scales in the TREC survey. This scale is a count of the number of health professionals (healthcare aides, LPNs, RNs, MDs, therapists, educators, other) who were consulted by healthcare aides about resident care in the last month. It ranged in value from 0 to 6.

- Conceptual research use (CRU) is operationalized for healthcare aides as thinking about best practice knowledge. CRU has 5 items measured on a 5-point Likert scale ranging from never to almost always and has been validated [35]. For example, healthcare aides were asked: 'On your last typical work day (on your unit), how often did best practice knowledge about things like pain management, managing difficult behaviors and managing pressure ulcers raise your awareness about new ways to care for residents?'

- Instrumental research use (IRU) is operationalized for healthcare aides as a direct and concrete use of research evidence in their care (e.g., use of guidelines and protocols). IRU has 5 items measured on a 5-point Likert scale ranging from never to almost always. For example, healthcare aides were asked: 'On your last typical work day (on your unit), how often did you use best practice knowledge about things like pain management, managing difficult behaviors and managing pressure ulcers to provide resident care?'

To understand the effect of quality of care at the bedside we used risk-adjusted quality indicators derived from RAI-MDS 2.0 data. For all of the participating facilities, in particular for the SCOPE units, we collected quarterly RAI-MDS data beginning in 2009 until the first quarter of 2012. For each clinical area we selected appropriate RAI-MDS quality indicators. The RAI-MDS data underwent quality checks and then quality indicators were computed. All except daily pain are risk-adjusted using standard methods from the Canadian Institute of Health Information [36]. (See Table 2).

Data analysis

We used descriptive statistics to analyze survey data and thematic analysis methods to analyze the field note data [37]. The qualitative analysis of the field notes combined

Table 2 RAI-MDS quality indicators for SCOPE units

Clinical focus	Indicator	% of residents with ...
Behaviour	BEHD4	Declining behavioural symptoms
	BEHI4*	Improving behavioral symptoms
Pain	Daily pain	Moderate to severe pain on a daily basis
	PAI0X	Moderate to severe pain
	PAN01	Worsening pain
Skin	PRU05	A stage 2 to 4 pressure ulcer
	PRU06	Worsening stage 2 to 4 pressure ulcer
	PRU09	Newly occurring stage 2 to 4 pressure ulcer

* Note that for BEHI4 higher is better while for all others lower is better.

Table 3 Characteristics of the SCOPE facilities

Province	Facility	Number of beds*	Number of units	Scope area	Clinical area
Alberta	A	200-300	6	Unit 5	Behaviour
				Unit 6	Pain
	B	>300	8	Unit 1	Pain
				Unit 4	Skin
				Unit 7	Behaviour
British Columbia	C	100-200	2	Unit 1	Skin
	D	<100	4	Unit 3	Pain
	E	<100	6	Units1, 2	Behaviour
	F	<100	6	Units 1, 2, 3	Behaviour
	G	<100	2	Unit 2	Pain

*Bed range given here to ensure anonymity.

Table 4 Mixed methods ranking of fidelity of SCOPE areas to the SCOPE process

Province	Facility	Scope area	Clinical area	Rank
Alberta	A	Unit 5	Behaviour	7
		Unit 6	Pain	10
	B	Unit 1	Pain	3
		Unit 4	Skin	2
		Unit 7	Behaviour	5
British Columbia	C	Unit 1	Skin	4
	D	Unit 3	Pain	6
	E	Units1,2	Behaviour	1
	F	Units 1, 2, 3	Behaviour	9
	G	Unit 2	Pain	8

with our measures addressing adherence to the collaborative model allowed us to rank the teams. QI team success was ranked based on the team's process work (rather than outcome) for the duration of the intervention. This was done by 3 members of the research team. First, the QI advisor independently ranked the team's success based on her experience working with them. Second, the 2 SCOPE team members who conducted field note thematic analysis met to rank the teams jointly. This ranking was then compared to the SCOPE QI advisors' ranking of each team.

We had originally planned to use a before and after design and ANOVA to analyze findings, including demographic variables such as size of unit as covariates [9]. We present instead pre- and post-scope mean values of the scales of interest. While we understood that in a pilot we would be underpowered to find differences, it was important as part of the proof-of-principle to ensure we could collect these data efficiently and use it in modeling.

The collection of survey data in the pilot was a second issue. We have previously demonstrated that we need at least 10, preferably 15, healthcare aide responses from a unit to allow aggregation of healthcare aide scores to get a stable unit score [38]. However, due to our limited funding and timeline, we elected only to collect sufficient data to get a stable estimate of important concepts at the facility

Table 5 Mean Pre- and Post-survey results from Facilities with SCOPE sites

	Pre SCOPE		Post SCOPE		
	Mean	SD	Mean	SD	P-value
Evaluation	3.45	0.44	3.61	0.20	0.401
Informal Interactions	4.04	0.31	4.06	0.27	0.925
OS Time	3.23	0.45	3.29	0.22	0.771
CRU	3.67	0.45	3.73	0.40	0.786
Job Satisfaction	4.02	0.37	4.03	0.13	0.941
Exhaustion	2.29	0.41	2.36	0.33	0.715
Cynicism	1.90	0.48	2.17	0.46	0.304
Job efficacy	5.02	0.43	4.90	0.35	0.555
SF8 physical	49.43	1.96	47.92	1.08	0.099
SF8 mental	49.87	2.48	49.84	0.96	0.975

Note: The mean and SD values are facility level values so significance tests cannot be run among the sites since each facility has only one data point. Therefore, the significance test is compared by Time Point.

level and not the more expensive and time-consuming collection of the larger amount that would allow unit-level measurement. We realized that the majority of change arising from the intervention would be expected to occur in SCOPE units over the 12 month time period of the SCOPE pilot. If the pilot were to have an effect on the whole facility, it would likely occur more slowly and probably not be detectable at the close of the pilot.

We analysed the RAI-MDS quality indicators using statistical process control (SPC) methods, for each of the areas in which SCOPE teams worked, which are widely used in QI and assurance work [39,40]. We defined and validated a procedure and set of rules to allow us to categorize these control charts. Using these rules we addressed the question: "Was there improvement in the quality indicators coordinated in time with initiation of the SCOPE pilot project?" Two independent raters coded the indicator control charts as showing improvement after the start of the pilot, demonstrating worse performance after the start of the pilot, having the same performance before and after the pilot or indeterminate. We then classified a SCOPE area as showing clinical improvement if a majority of their control charts for appropriate RAI quality indicators showed improvement after the start of the pilot.

Results

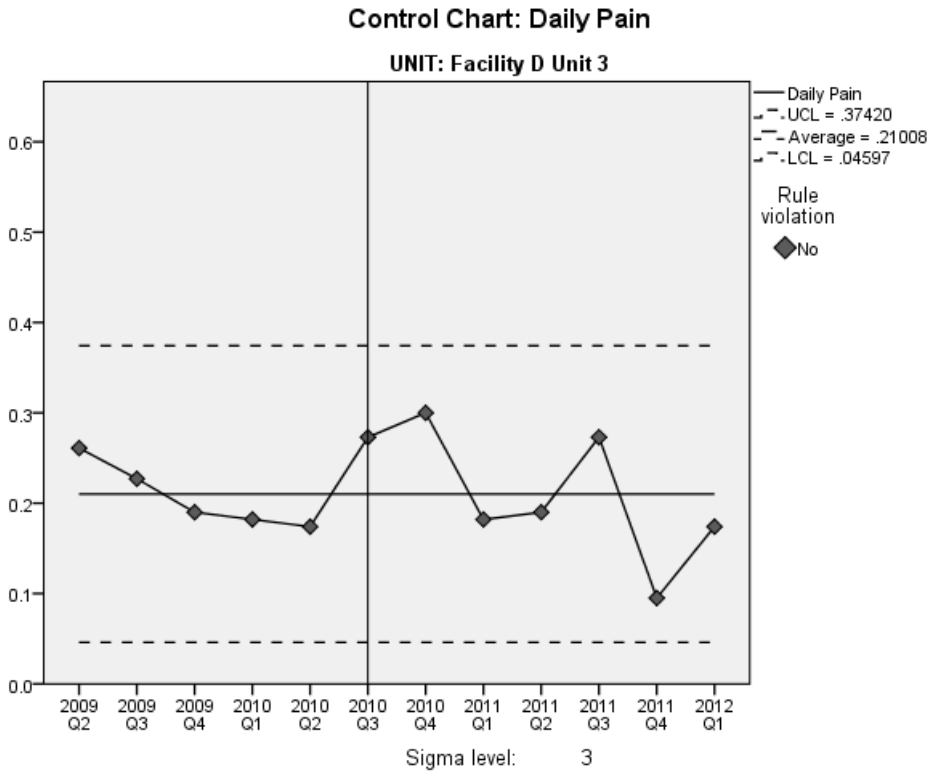
The characteristics of nursing homes are displayed in Table 3. The main objective of the SCOPE pilot study was to investigate whether the intervention could be conducted. The answer to this question is yes. All 10 teams sent 2 or more representatives and a senior sponsor to each learning session. The teams regularly attended monthly teleconferences, produced run charts of locally collected data and had increasing enthusiasm for the SCOPE intervention as the pilot progressed. The ranking of the teams' progress is displayed in Table 4 which also indicates the clinical focus of each of the teams. The teams were ranked similarly by the QI advisor and the 2 members of the research team. The teams included in the *top quarter* (i.e., teams ranked 1-4) were ranked within this same range, but in a different order. The teams included in the *middle quarter* (i.e., teams ranked 5-8) were also ranked within this same range, but in a different order. The *last 2 teams* were ranked the same, but in reverse order. We report the QI advisor's ranking results as her interpretation reflected ongoing interactions with the teams throughout the study.

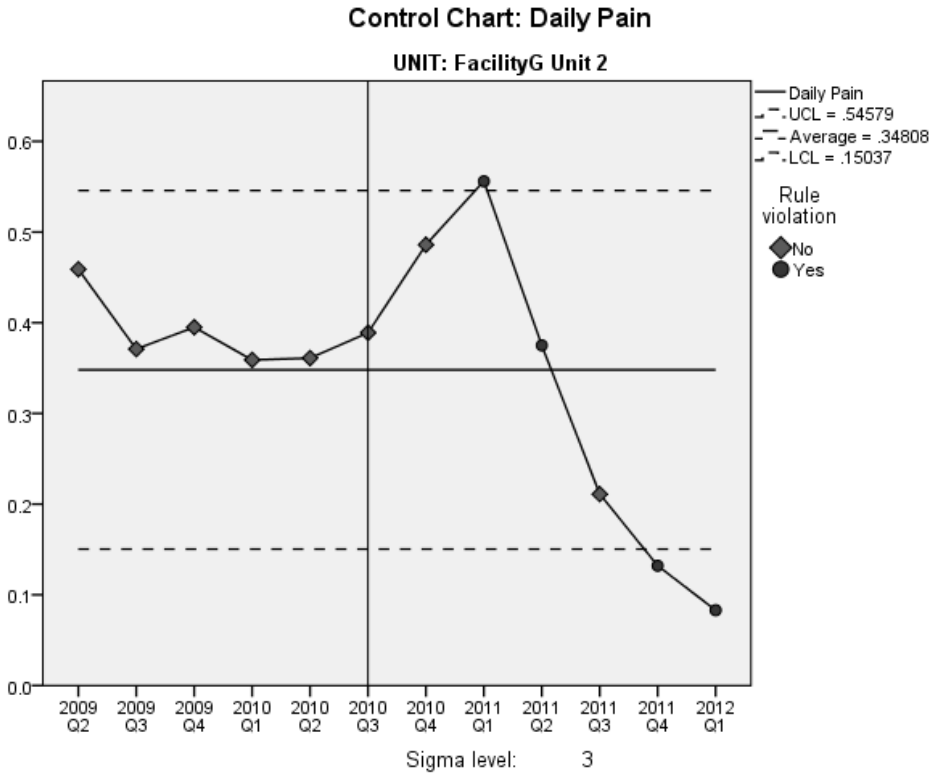
Average pre and post SCOPE values of the scales of interest are presented in Table 5. As expected, there were no significant differences between time points. Part of the reason may be that we are looking at facility level measurement and SCOPE is a unit level intervention; equally as likely, we were not sufficiently powered to detect difference that may have been present.

Our RAI data allowed us to compute the quality indicators at the unit level. See Figure 1 for 2 examples of the unit-level control charts reflecting RAI data from quarter 2 of 2009 until quarter 1 of 2012; the SCOPE pilot began in quarter 3 of 2010. When 2 independent raters categorized the control charts they agreed on the coding in 22 of 26 (84.6%) cases. In the remaining 4 cases, consensus through discussion resulted in 3 being coded as indeterminate and one as showing improvement after the pilot began. We see in the first chart in Figure 1, that no improvement occurred after quarter 3 of 2010 (Facility D, Unit 3) and in the second chart (Facility G, Unit 2) we see an immediate increase in daily pain after the beginning of SCOPE. This is probably a reflection of more awareness of pain in the unit and a better reporting of pain by healthcare aides to the regulated professional staff. After about 6 months, this unit showed a reduction in the indicator with each quarter, that is, a lower percentage of patients with severe to daily pain.

We classified SCOPE areas as improved or not if they showed clinical improvement in a majority of their control

Figure 1 Two examples of control charts for two SCOPE Units





charts for appropriate RAI quality indicators. Using this rule, 50% of the 10 SCOPE areas were deemed to have shown improvement coordinated in time with the SCOPE pilot intervention. Fifty percent of the teams working in each of the clinical areas (pain, skin and behavior) showed improvement.

Discussion

The results of this pilot study are encouraging for those who wish to carry out bedside level QI in the nursing home sector. There is considerable interest in and activity going on in the QI area in long term care [41-47]. This QI work has been led by registered healthcare providers and healthcare aides who are commonly directed only to implement new protocols. In our work, we have clearly shown that it is possible to have QI teams, led by front-line non-regulated caregivers, carry out quality improvement in a collaborative environment. At least 70% of our teams were judged to have succeeded in learning and applying the improvement model and methods for local measurement. On the basis of this information we are developing a full-scale implementation and evaluation of the SCOPE model.

We were perhaps surprised to see that in 50% of the nursing home teams, unit level quality indicators based on RAI data showed measurable improvement in the clinical area of interest to the teams. In some cases these changes were substantial. For example, consider the control chart for Facility G, Unit 2 shown in Figure 1. Prior to initiation of the SCOPE process, which focused on reducing pain in this unit, the prevalence of residents with moderate to severe daily pain was around 40%. A year and a half after beginning the SCOPE process this incidence had fallen to less than 10%.

It was easier for us to implement the SCOPE process and to engage senior sponsors than we had anticipated. While some participants were sceptical at learning session 1, by the Final Congress there was significant and across the board enthusiasm and support for this type of work. We know from our TREC work that healthcare aides are often working in difficult situations with little access to or assistance from the registered care providers – nurses, pharmacists, therapists and physicians. We also know that the same healthcare aides score highly on job efficacy – the sense that their work is worthwhile. We believe that the SCOPE process leveraged off this untapped sense of job efficacy.

The success of our SCOPE initiative may also be related to the concept of positive deviance. Positive deviance was pioneered by Jerry and Monique Sternin and, as adapted to healthcare, “presumes that the knowledge about 'what works' is available in existing organizations” [48,49]. In the case of nursing homes in Western Canada where 80% or more of the direct bedside care is delivered by healthcare aides, much of this knowledge of ‘what works’ resides in the healthcare aides. Allowing them the opportunity and giving the language and tools of QI and support of the senior sponsor enabled them to mobilize this embedded knowledge and effectively change practice at the bedside.

This small pilot study has several limitations. First, the sample of homes was a convenience one. No effort was made to ensure representativeness. Therefore, the full effect of the SCOPE-like intervention is unknown. However, we believe the pilot study offers sufficient evidence to allow us to go forward with a carefully designed study to fully evaluate the effects of SCOPE on both bedside care and quality work of life. Second, our sample size of 7 nursing homes and 10 teams was small for unit level analysis and insufficient to detect differences on the survey measures. Third, the pilot occurred in only 2 jurisdictions, Alberta and BC. In both of these jurisdictions, the health authorities had launched quality initiatives such that quality consultants were available to the nursing homes and RAI reports had been circulated to the facilities. However, prior to SCOPE, there was frustration with these initiatives. First, the consultants were unable to make substantial changes in practice or improvements in clinical care. Second, while the RAI reports were extensive, the majority of front-line staff and their supervisors found them overly dense, difficult to interpret and use for targeting improvement activities.

Conclusion

To conclude, we have demonstrated the ability of healthcare aides to engage in quality improvement initiatives at the bedside. The need for education concerning the concepts of improvement and measurement in this effort is critical. However, with a thoughtfully planned program that offers information, coaching and networking and with the concrete support of senior sponsors, healthcare aides are able to master the improvement model, local measurement and the PDSA method. They can contribute measurably to improved care at the bedside.

Acknowledgements and Conflicts of Interest

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