

Workplace Interventions, Turnover, and Quality of Care Report

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This report results from a series of studies commissioned by the North Carolina Division of Health Service Regulation and conducted and compiled by the North Carolina Institute on Aging (NCIOA).

Executive Summary

Introduction and Purpose

The purpose of this report is to examine the impact of three workplace interventions on quality of care measures and turnover of nurse aides in nursing homes in North Carolina between 2004 and 2007.

The study was commissioned by the Division of Health Service Regulation and examines the impact of three types of interventions funded by Civil Monetary Penalties—funds collected from NC nursing homes for deficiencies in care. These include:

- the **WIN A STEP UP program**, an initiative that upgrades skills of nursing assistants, increases their job commitment, and provides rewards and recognition;
- **Quality Improvement Collaboratives** in which groups of nursing homes work together with the statewide Quality Improvement Organization to improve specific quality indicators like reducing pressure sores or the use of restraints;
- **Culture Change Initiatives**, in which nursing homes implement changes in their philosophies, environments, or routines designed to make their environments more “homelike.”

Methodology

Quality of care was measured using four quality indicators from the Nursing Home Compare dataset available from the Centers for Medicare and Medicaid, including use of restraints, incidence of pressure sores, incidence of weight loss, and management of incontinence. Nurse aide turnover data is collected yearly by the Division of Health Services Regulation and the UNC Institute on Aging.

Findings

The findings of the study suggest that workplace interventions initiated in North Carolina have had a significant positive effect on both quality of care and turnover of nurse aides.

- Facilities that implemented WIN A STEP experienced a significant decrease in pressure sores and turnover of nurse aides.
- Facilities that implemented CCME quality improvement collaboratives experienced a significant reduction in incontinence and the use of restraints.
- Facilities that implemented “culture change” initiatives experienced a significant reduction in the use of restraints.

In sum, three quality improvement initiatives have demonstrated a significant impact on quality and/or turnover. Overall, it appears that the investment that North Carolina is making in quality improvement initiatives is having a positive and significant impact on nursing home performance in North Carolina.

Introduction

As the US population ages, the demand for all types of healthcare, including acute care, long-term care, and short-term rehab, is expected to grow dramatically. At the same time, many are concerned about both the stability of the long-term care workforce and quality of care provided (Stone & Weiner, 2001). The Government Accountability Office (GAO) reports that the proportion of nursing homes with serious quality problems remains unacceptably high, despite an overall decline in the incidence of reported problems (GAO, 2002).

Previous research has shown that high levels of turnover and worker shortages may compromise both the availability of frontline workers and quality of care provided in long-term care settings (Kash, Castle, Naufal, & Hawes, 2006; Harrington, Zimmerman, Karon, Robinson & Beutel, 2000; Castle, Engberg, & Men, 2007). Studies in North Carolina have found that separation rates for nurse aides in nursing homes have exceeded 100% per year for the last three years (Konrad, Morgan, and Dill, 2008b). Low wages, limited benefits, and heavy workloads have been associated with poor job satisfaction and high turnover of nurse aides (Castle, Engberg, Anderson, & Men, 2007). In 2006, nurse aide registrants in NC had a median wage of only \$15,431 and held an average of two jobs either consecutively or concurrently during that year (Konrad, Morgan and Dill, 2008a). A statewide survey found that 32% of nurse aides surveyed in North Carolina reported not having health insurance from any source and 30% reported often or routinely being physically exhausted at the end of a shift. About half of nurse aides are African American, 13% have less than a high school diploma and on average these workers have 12.5 years of school (Morgan, 2005).

In the state of North Carolina, several workplace-based interventions have been developed to address staffing and quality of care concerns. However, few of the programs piloted in North Carolina or nationally have been rigorously examined for effectiveness (Harris-Kojetin et al., 2004; Morgan & Konrad, 2008). In this study, we seek to assess the impact of four workplace-based development interventions on 1) quality of care outcomes, and 2) turnover rates for nursing homes in North Carolina using a research design that statistically controls for the organizational and economic factors.

Workplace-Based Interventions

To address the problem of nurse aide recruitment and retention, many NC nursing facilities have initiated a diverse array of workforce interventions, “culture change” initiatives, and other organizational changes. In this study, we will be evaluating the effectiveness of four intervention programs in 1) improving quality outcomes and 2) reducing turnover of nurse aides and management in nursing homes. Programs that will be considered in this evaluation include:

1. *“Culture change” initiatives* in North Carolina nursing homes funded by Civil Monetary Penalty Funds. Grants are issued every three years to approximately 15 facilities. The grants are designed to improve the quality of life for residents in Medicare/Medicaid-certified nursing homes in North Carolina through promotion of positive environmental and cultural changes within these homes. Facilities base these changes on the culture change models that best fit their vision for transforming the medical model of nursing homes to more homelike settings. The grants allow facilities to make alterations in their buildings and enhance overall culture according to the needs and wants of their residents and staff (NCDHHS, 2009).
2. The *WIN A STEP UP* program (which stands for Workforce Improvement for Nursing Assistants: Supporting Training, Education, and Payment for Upgrading Performance), a workforce intervention that aims to address the problem of nurse aide recruitment and retention in North Carolina. The WIN A STEP UP workforce intervention is implemented in 10-18 facilities in North Carolina per year and is also funded by Civil Monetary Penalty Funds. WIN A STEP UP is a partnership of the NC Department of Health and Human Services and the UNC Institute on Aging. Nurse aides who participate in the program complete a 30-hour curriculum, agree to continue working for their employer, and receive a bonus or raise from their employer. Frontline supervisors receive training to improve management skills and communication with nurse aides (WIN A STEP UP, 2009).

3. Quality improvement collaboratives (QIC) funded by the Carolinas Center for Medical Excellence (CCME), the Quality Initiative Organization (QIO) for North and South Carolina. Approximately 20% of all nursing homes in North Carolina each year participate in CCME interventions, which focus on two areas of quality improvement: pressure sores and physical restraints. CCME's program that focuses on physical restraints works with participating nursing homes to implement care processes to reduce the use of physical restraints and to address areas of resident harm. CCME's intervention that focuses on pressures sores works with participating nursing homes to implement care processes for the prevention, treatment, and management of pressure sores (CCME, 2009; Colon-Emeric, et al., 2006).

Methods

Nursing home quality of care

In order to evaluate the long-term effect of workplace-based intervention on nursing home quality, we used the Nursing Home Compare (NHC) data set, a Web-based report card system that provides information on virtually every Medicare- or Medicaid-certified nursing home in the United States. The current 14 quality measures reported are subject to extensive testing, are derived from the Minimum Data Set (part of the U.S. federally mandated process for clinical assessment of all residents in Medicare or Medicaid certified nursing homes), and represent measures relevant to both nursing home consumers and providers (GAO, 2002). This study focuses on the evaluation of four specific NHC quality measure from 2004 to 2007 that were chosen in consultation with NC Division of Health Service Regulation (DHSR), including:

- 1) Use of physical restraints: the percent of long-stay residents¹ who were physically restrained.
- 2) Incidence of pressure ulcers: the percent of high-risk long-stay residents who have pressure sores.
- 3) Incidence of malnourishment (weight loss): the percent of long-stay residents who lose too much weight.
- 4) Better management of incontinence: the percent of low-risk long-stay residents who lose control of their bowels or bladder.

We performed regression analyses to identify the effect of a specific workplace-based intervention on each of the selected quality of care measures using three and half a years of Nursing Home Compare data from July, 2004 and December, 2007. We chose to evaluate each intervention separately as most facilities participated in one of the four programs. Our data

¹ Long-stay residents are people in an extended or permanent nursing home stays, and high or low risk definitions are measure-specific (The Centers for Medicare and Medicaid Services (CMS)). The reporting period of the NHC quality measures is by quarter.

shows that only eight facilities participated in both the WIN A STEP UP and QIC and four facilities participated in both the culture change and WIN A STEP UP. To address the potential selection bias associated with voluntary participation of nursing homes into these interventions, we used fixed effect methods and limited the sample to participating facilities as suggested by Zarkin, Bray, & Qi (2000). We followed that approach on the evaluation of both the impact of WIN A STEP UP and CCME QIC, but increased our analysis sample to include all facilities in North Carolina for the “culture change” initiatives since all participating facilities received the intervention at the same time, which called for a different regression model. For evaluating the impact of “culture change” initiatives, we defined program participation by year and created a variable to indicate that a facility has received the grant in 2004-2005.² For participation in either WIN A STEP UP or QIC, program period was measured by quarters since participation was based on each facility’s first contract date.

The strength of our fixed effect methods is that it allows us to find the programs’ impact by self-comparison within the set of participating facilities. However, the cost associated with these methods is such that we could only control for facility characteristics that vary over time. Therefore, we included three organization variables in the analyses of quality of care: the total number of residents in a facility, the number of staffing hours per resident per day by all licensed staff such as the registered nurses, and the hours by nurse aides only. Other facility characteristics, such as type of ownership, affiliation, or location, cannot be included in the model because they do not vary over time. However, the fixed-effects model controls for time-invariant facility characteristics even though these characteristics are not specified.

² Culture change initiative grants were awarded for a two-year period. We are looking at grants that were awarded in 2004 and ended in 2005.

Nurse Aide Turnover

To examine the effectiveness of WIN A STEP UP, CCME initiatives, and “culture change” initiatives in lowering turnover, we looked at yearly turnover rates of nurse aides in nursing homes participating in one or more initiatives as compared to all other nursing facilities in North Carolina. Our calculation of turnover is based on the number of nurse aides who left within a year divided by the number of nurse aides who are budgeted by the nursing home (Price, 1977), and takes into account both voluntary and involuntary turnover. Staffing numbers are reported by nursing home administrators.³

In this study, we examine turnover as a binary variable of “below-average” versus “above-average” turnover. The average turnover rate in our sample is 118 percent; thus, facilities with turnover rates below 118 percent are in the “below-average” category, while those with turnover rates above 118 percent are in the “above-average” category. We decided to use a binary dependent variable rather than using turnover rate as a continuous variable because we believe that the relationship between participation in workforce interventions and turnover is non-linear. Nursing homes with exceptionally high turnover may not see a substantial reduction in turnover due to the limited capacity of workforce interventions to change organizational policies and practices that may be contributing to extremely high turnover rates. Nursing homes with lower turnover are less likely to receive substantial benefit in terms of retention even if other outcomes such as improved teamwork and improved job performance of nurse aides are realized (Brannon, Zinn, More, & Davis, 2002; Morgan & Konrad, 2008). Testing turnover rate as a binary outcome allows us to understand whether

³ Turnover rates have been calculated using a variety of methods in the long-term care literature (Barry, Kemper, & Brannon, 2008; Castle, 2006). Our method is consistent with turnover calculations used by Castle (2005, 2006), Anderson (2004), and Barry, Brannon, and Mor (2005), although it should be noted that several of these studies employed a six-month time frame, rather than a yearly time frame.

nursing homes in the middle group are able to cross below the mean threshold (which is still substantially high turnover) as a result of their participation in workforce interventions.⁴ A random effects logit model was used to analyze the effect of workplace-based interventions on turnover.

Nursing home organizational characteristics

Since the relationship between intervention participation and care quality may vary by other facility characteristics, we included several organizational-level variables as controls in our analyses, including occupancy, location, ownership, hospital affiliation, and chain membership. Occupancy was measured as the total number of residents in a facility. Location was defined as rural versus urban. Type of ownership was in three major categories: for-profit, non-profit and government-own. Both hospital affiliation and chain membership were constructed as dichotomous variables of “Yes” and “No”. See Table 1 below for a summary of the organizational characteristics of nursing homes in North Carolina.

⁴ Using a non-linear form of turnover rates is not unprecedented in the long-term care research. Brannon, Zinn, Mor, and Davis (2002) use a categorical variable of high/medium/low turnover in their study of the impact of organizational and environmental factors on nurse aide turnover in nursing homes. The authors argue that if both very low turnover and very high turnover are potentially problematic, then linear regression models can be uninformative and obscure differences between factors associated with either low or high turnover. Likewise, we argue that if WIN A STEP UP is likely to have minimal impact in nursing facilities with both very high and very low turnover, then linear regression models will be uninformative.

Table 1.
Organizational Characteristics of Nursing Homes,
North Carolina, 2004-2007.

| Variable | Percent or Mean | (Std. dev.) |
|--------------------------|--------------------|-------------|
| Licensed staff hours | 2.01 | (1.23) |
| Nurse aide hours | 2.35 | (0.68) |
| Certified number of bed | 110.34 | (42.76) |
| Number of residents | 98.38 | (38.20) |
| For-profit | 78.80% | |
| Non-profit | 18.80% | |
| Hospital affiliation | 5.90% | |
| Part of a chain | 70.20% | |
| Rural | 7.20% | |
| Metro | 58.6% | |
| Urban | 34.20% | |
| County unemployment rate | 5.17% | (0.94) |

Data source: Nursing Home Compare.

Results: Nursing Home Quality of Care

WIN A STEP UP

Table 2 below presents the average percentage of residents with pressure sores, incontinence, restraint use, and weight loss in facilities that participated in WIN A STEP UP at some point between 2004 and 2007.

Table 2.
Descriptive statistics on quality indicators among WIN A STEP UP facilities, 2004-2007.

| | Pressure sores (%) | | Incontinence (%) | | Restraint use (%) | | Weight loss (%) | |
|------------|--------------------|------|------------------|-------|-------------------|------|-----------------|------|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 2004 | 13.96 | 5.52 | 51.36 | 12.50 | 8.65 | 8.24 | 10.88 | 5.91 |
| 2005 | 14.56 | 6.15 | 52.49 | 12.76 | 9.44 | 7.99 | 11.14 | 6.05 |
| 2006 | 12.51 | 5.81 | 53.82 | 12.04 | 9.54 | 7.47 | 10.04 | 5.62 |
| 2007 | 12.83 | 5.87 | 53.90 | 12.07 | 9.40 | 7.44 | 9.89 | 5.39 |
| Facilities | 64 | | 61 | | 64 | | 64 | |

Data Source: Nursing Home Compare.

Table 3 below presents the results of the impact of participation in WIN A STEP UP on four quality indicators among all facilities that have participated in the program between 2002 and 2007.⁵ Participation in WIN A STEP UP was found to have a significant effect in reducing pressure sore prevalence in a facility in the third and fourth quarter after the facility implemented WIN A STEP UP. The largest reduction in pressure sore prevalence was found in

⁵ We only examine the impact of WIN A STEP UP implementation between 2004 and 2007. However, we included facilities who participated in WIN A STEP UP between 2002 and 2007 in the sample for this analysis.

the seventh quarter after participation, which was 3.49 percentage points lower than the prevalence level prior to participation for the same facility.

We did not find any consistent relationship between WIN A STEP UP participation and incontinence, restraint use, or weight loss after WIN A STEP UP implementation.

Table 3.
Results: quality indicators among facilities that have participated in WIN A STEP UP, North Carolina, 2005-2007

| | pressure sores | incontinence | restraint use | weight loss |
|------------------------------------------|------------------|------------------|------------------|------------------|
| | Coefficient (SD) | Coefficient (SD) | Coefficient (SD) | Coefficient (SD) |
| <u>Quarter of participation</u> | | | | |
| Quarter of WIN A STEP UP implementation | -0.25 (0.80) | 1.33 (1.21) | 0.03 (0.76) | -0.13 (0.74) |
| 1st Qtr after WIN A STEP UP | 0.11 (0.84) | 0.56 (1.27) | 0.40 (0.81) | 0.30 (0.79) |
| 2nd Qtr after WIN A STEP UP | -0.84 (0.91) | 0.94 (1.40) | 0.53 (0.88) | 1.49 (0.87) * |
| 3rd Qtr after WIN A STEP UP | -1.90 (0.96) ** | 0.76 (1.51) | 0.53 (0.93) | -0.47 (0.91) |
| 4th Qtr after WIN A STEP UP | -1.82 (0.98) * | 0.59 (1.51) | 1.30 (0.93) | 0.96 (0.92) |
| 5th Qtr after WIN A STEP UP | -1.01 (1.05) | 1.27 (1.62) | 1.81 (1.01) * | 0.46 (0.99) |
| 6th Qtr after WIN A STEP UP | -1.57 (1.05) | 0.31 (1.54) | 0.66 (1.00) | 0.39 (0.98) |
| 7th Qtr after WIN A STEP UP | -3.49 (1.10) *** | -0.45 (1.64) | 0.60 (1.04) | -1.36 (1.02) |
| 8th Qtr after WIN A STEP UP | -1.81 (1.25) | 0.28 (1.92) | 1.45 (1.20) | 0.71 (1.18) |
| <u>Facility Characteristics</u> | | | | |
| Number of residents | 0.01 (0.03) | 0.04 (0.05) | 0.06 (0.03) * | 0.01 (0.03) |
| Licensed staff hours | 0.46 (0.63) | 2.22 (0.97) ** | 0.59 (0.57) | -0.30 (0.56) |
| Nurse aide hours | 0.37 (0.46) | 2.65 (0.84) *** | 0.67 (0.45) | 1.53 (0.44) *** |
| <u>Time Variables^a</u> | | | | |
| Quarters in 2005 | 2.02 (1.55) | 5.98 (2.39) ** | 1.97 (1.43) | -0.37 (1.41) |
| Quarters in 2006 | 0.24 (1.55) | 7.91 (2.39) *** | 2.05 (1.44) | -1.52 (1.42) |
| Quarters in 2007 | 0.50 (1.55) | 8.39 (2.40) *** | 1.98 (1.44) | -1.73 (1.42) |
| N (sample size) | 837 | 780 | 884 | 884 |
| Facility fixed -effects | 64 | 61 | 64 | 64 |

^aTime variables indicate the degree to which the quality measure has changed for all facilities in the specified year.
* ≤ .05, ** ≤ .01, *** ≤ .001

Quality improvement initiatives of Carolina Center for Medical Excellence (CCME-QI)

Table 4 below presents the average percentage of residents with pressure sores, incontinence, restraint use, and weight loss in facilities that participated in CCME Quality Improvement Collaboratives at some point between 2004 and 2007.

Table 4.
Descriptive statistics on quality indicators among CCME QIC facilities, 2004-2007.

| | Pressure sores (%) | | Incontinence (%) | | Restraint use (%) | | Weight loss (%) | |
|------------|--------------------|------|------------------|-------|-------------------|------|-----------------|------|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 2004 | 13.98 | 7.01 | 49.21 | 12.29 | 8.91 | 7.03 | 9.52 | 5.33 |
| 2005 | 13.44 | 6.56 | 49.58 | 12.37 | 9.29 | 7.43 | 9.85 | 4.88 |
| 2006 | 11.86 | 5.90 | 50.51 | 13.29 | 8.52 | 7.10 | 9.58 | 5.37 |
| 2007 | 11.86 | 5.54 | 51.05 | 13.37 | 8.12 | 6.69 | 9.48 | 5.40 |
| Facilities | 74 | | 72 | | 79 | | 79 | |

Data Source: Nursing Home Compare.

Table 5 presents the results of the impact of participation in CCME Quality Improvement Collaboratives on four quality indicators in all facilities that participated in the program between July, 2004 and June, 2006. Participation in CCME interventions is associated with significantly lower restraint use, particularly after the intervention has been in place for over a year. Participation in CCME interventions is also significantly associated with higher incontinence when the intervention is first implemented. However, after the intervention had been in place for over one year, the participating facilities did not have significantly higher problems with incontinence. These findings may be due to fact that CCME tries to recruit facilities with the intent of remediating problems with quality of care; therefore, it is not surprising that facilities choosing to participate in CCME initiatives may tend to have somewhat higher values on their quality measures when they first enroll in the CCME intervention.

Sporadic increases were also found in the prevalence of pressure sore and weight loss but overall there was no consistent association between CCME intervention participation and those two outcomes.

Table 5.
Results on quality indicators among facilities that participated in CCME Quality Initiatives.

| | pressure sore | incontinence | restraint use | weight loss |
|-----------------------------------|----------------------|---------------------|----------------------|--------------------|
| | Coefficient (SD) | Coefficient (SD) | Coefficient (SD) | Coefficient (SD) |
| <i>Quarter of Participation</i> | | | | |
| Qtr of CCME QI Implementation | 0.68 (0.63) | 1.64 (1.00) | 0.24 (0.53) | 0.23 (0.52) |
| 1st Qtr after CCME QI | 1.66 (0.63) *** | 2.90 (1.01) *** | -0.56 (0.54) | 0.85 (0.52) |
| 2nd Qtr after CCME QI | 1.16 (0.61) ** | 3.27 (0.98) *** | -0.82 (0.52) | 1.18 (0.50) ** |
| 3rd Qtr after CCME QI | 0.70 (0.61) | 3.08 (1.00) *** | -0.74 (0.52) | 0.82 (0.50) |
| 4th Qtr after CCME QI | 0.66 (0.61) | 2.47 (0.99) ** | -0.93 (0.52) * | 0.75 (0.50) |
| 5th Qtr after CCME QI | 0.30 (0.61) | 2.39 (0.97) ** | -0.92 (0.52) * | -0.24 (0.50) |
| 6th Qtr after CCME QI | 0.02 (0.68) | -0.63 (1.10) | -0.29 (0.59) | -0.06 (0.57) |
| 7th Qtr after CCME QI | -0.19 (0.68) | 0.77 (1.09) | 0.004 (0.59) | -0.36 (0.57) |
| 8th Qtr after CCME QI | 0.16 (0.69) | 1.08 (1.09) | -0.64 (0.58) | 0.15 (0.57) |
| <i>Facility Characteristics</i> | | | | |
| Number of residents | 0.06 (0.02) *** | 0.26 (0.06) *** | -0.05 (0.02) *** | 0.00 (0.02) |
| Licensed staff hours | -0.04 (0.45) | -2.01 (0.72) *** | -0.34 (0.38) | -0.03 (0.37) |
| Nurse aide hours | -0.41 (0.50) | 0.51 (0.95) | 0.98 (0.43) ** | 0.30 (0.41) |
| <i>Time Variables^a</i> | | | | |
| Quarters in 2005 | -0.23 (1.16) | -4.24 (1.84) ** | 0.20 (1.00) | 0.09 (0.97) |
| Quarters in 2006 | -1.23 (1.20) | -2.37 (1.88) | -0.76 (1.02) | -0.0003 (1.00) |
| Quarters in 2007 | -1.02 (1.19) | -0.94 (1.88) | -1.37 (1.02) | -0.02 (1.00) |
| N (sample size) | 920 | 907 | 1023 | 1023 |
| Facility fixed -effects | 74 | 72 | 79 | 79 |

^aTime variables indicate the degree to which the quality measure has changed for all facilities in the specified year.
* ≤ .05, ** ≤ .01, *** ≤ .001

Culture change initiatives

Table 6 below presents the average percentage of residents with pressure sores, incontinence, restraint use, and weight loss in facilities that participated in “culture change” initiatives for 2004-2007.

| | Pressure sores (%) | | Incontinence (%) | | Restraint use (%) | | Weight loss (%) | |
|------------|--------------------|------|------------------|-------|-------------------|------|-----------------|------|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 2004 | 14.19 | 5.30 | 50.88 | 9.65 | 8.00 | 6.90 | 9.62 | 3.99 |
| 2005 | 12.81 | 6.07 | 54.54 | 12.48 | 7.79 | 6.50 | 9.79 | 4.34 |
| 2006 | 13.22 | 4.83 | 51.98 | 11.11 | 6.22 | 6.17 | 9.82 | 4.33 |
| 2007 | 12.85 | 5.16 | 51.92 | 10.36 | 6.96 | 6.77 | 9.19 | 3.81 |
| Facilities | 14 | | 14 | | 14 | | 14 | |

Data Source: Nursing Home Compare.

Table 7 summarizes estimates of the impact of the implementation of “culture change” initiatives on the four quality indicators among all facilities in North Carolina. We could not compare the participating facilities among themselves as we had done for the previous two interventions because all participating facilities received the intervention during the same period. The results indicate that facilities which received “culture change” grants had significantly lower use of restraints during the three year grant period as compared to other facilities in North Carolina. At the same time, results indicate that facilities participating in “culture change” initiatives had higher quality scores on the indicator for incontinence.

Table 7.
Results of “culture change” participation on quality indicators among all NC facilities.

| | pressure sore | incontinence | restraint use | weight loss |
|-------------------------------------------|----------------------|---------------------|----------------------|--------------------|
| | Coefficient (SD) | Coefficient (SD) | Coefficient (SD) | Coefficient (SD) |
| <i>Intervention Participation</i> | | | | |
| “Culture change” initiative participation | -0.44 (0.75) | 2.37 (1.18) ** | -1.44 (0.70) ** | 0.14 (0.69) |
| <i>Facility Characteristics</i> | | | | |
| Number of residents | 0.02 (0.01) * | 0.03 (0.02) | -0.02 (0.01) * | -0.01 (0.01) |
| Licensed staff hours | -0.04 (0.20) | 0.06 (0.29) | -0.61 (0.17) *** | -0.38 (0.17) ** |
| Nurse aide hours | 0.03 (0.19) | 0.41 (0.25) * | -0.07 (0.15) | 0.39 (0.15) *** |
| <i>Time Variables^a</i> | | | | |
| Quarters in 2005 | -0.32 (0.50) | 1.01 (0.74) | -1.16 (0.44) *** | -0.58 (0.44) |
| Quarters in 2006 | -1.61 (0.50) *** | 2.35 (0.74) *** | -1.87 (0.44) *** | -1.34 (0.44) *** |
| Quarters in 2007 | -1.72 (0.50) *** | 3.01 (0.74) *** | -2.62 (0.44) *** | -1.38 (0.44) *** |
| N (sample size) | 4564 | 4397 | 5062 | 5041 |
| Facility fixed-effects | 365 | 350 | 385 | 384 |

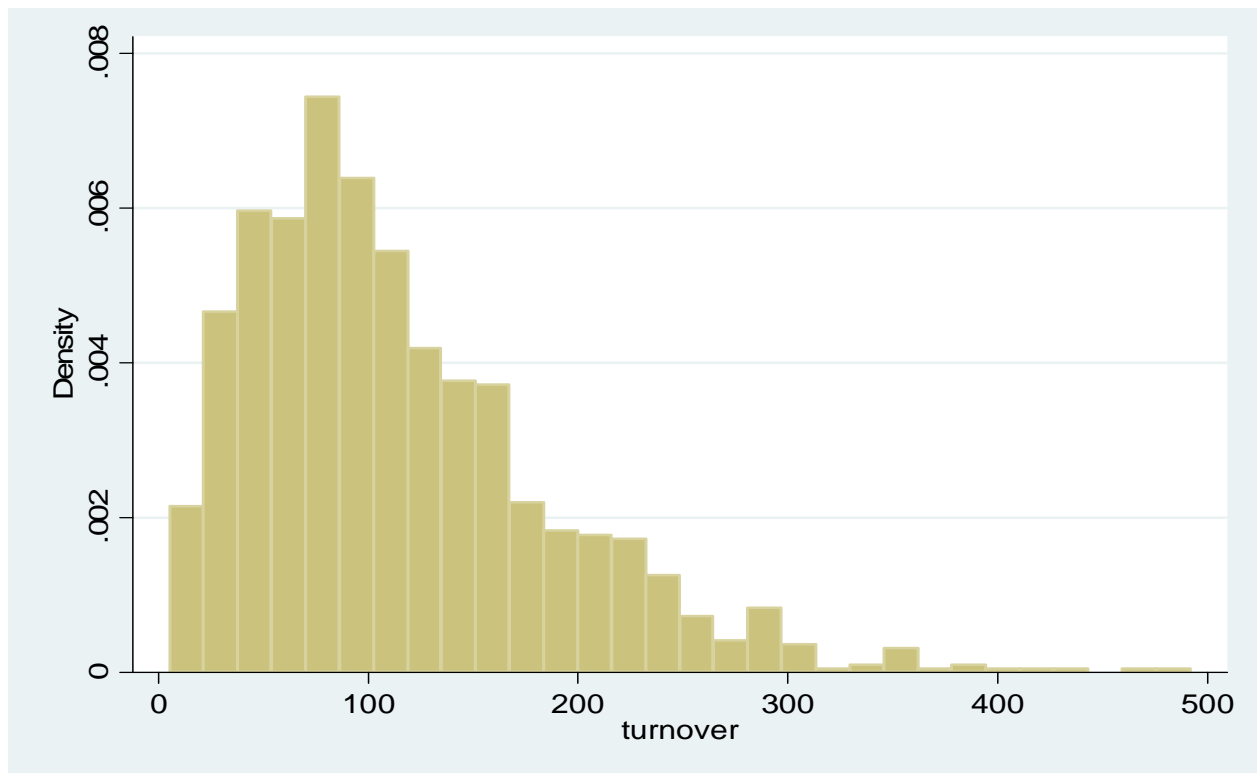
^a Time variables indicate the degree to which the quality measure has changed for all facilities in the specified year.

* ≤ .05, ** ≤ .01, *** ≤ .001

Results: Nurse Aide Turnover

As discussed above, in this study we examine turnover as a dichotomous variable of “below-average” versus “above-average” turnover. The average turnover rate in our sample is 118 percent; thus, facilities with turnover rates below 118 percent are in the “below-average” category, while those with turnover rates above 118 percent are in the “above-average” category. Fifty-four percent of facilities have “below-average” turnover, while 46% have “above-average” turnover. See Figure 1 below for a distribution of the turnover rates of nursing facilities in North Carolina.

Figure 1.
The distribution of annual turnover rates in nursing homes,
North Carolina, 2004 through 2007.



The results of our analysis show that nursing facilities that participated in the WIN A STEP UP intervention were significantly more likely to have “below-average” turnover – that is, a turnover rate below the mean rate of 118 percent - in the year that they participated in the intervention ($p=.004$). The incremental effect of participation in the WIN A STEP UP intervention is 27 percent. That is, on average, when a facility changed from a non-participating facility to a participating facility, the probability of having “below-average” turnover increased 27 percentage points. The impact of WIN A STEP UP on turnover persists with or without facility and labor market characteristics as controls. The “culture change” and CCME interventions did not have a significant impact on nurse aide turnover. See Table 8 below for a summary of the results.

Table 8.
**Analysis of the effect of workplace-based interventions on “below-average”
turnover of nurse aides.**

| | Odds Ratio | (Std. Err.) |
|------------------------------------------|------------|-------------|
| <i><u>Intervention Participation</u></i> | | |
| WIN A STEP UP intervention | 3.56 | (1.10)*** |
| Culture Change initiatives | 0.41 | (0.21) |
| CCME interventions | 1.16 | (0.26) |
| <i><u>Facility Characteristics</u></i> | | |
| Licensed staff hours | 0.94 | (0.10) |
| Nurse aide hours | 1.20 | (0.16) |
| Certified number of beds | 0.99 | (0.00)* |
| Number of residents | 1.02 | (0.01)** |
| For-profit | 1.41 | (1.24) |
| Non-profit | 5.46 | (4.85) |
| Hospital affiliation | 0.01 | (0.01)*** |
| Part of a chain | 0.87 | (0.16) |
| <i><u>Community Characteristics</u></i> | | |
| Rural | 1.33 | (0.41) |
| Urban | 1.11 | (0.20) |
| Unemployment rate | 1.04 | (0.09) |
| <i><u>Time Variables^a</u></i> | | |
| 2005 | 0.75 | (0.21) |
| 2006 | 0.77 | (0.23) |
| 2007 | 0.73 | (0.22) |

N (sample size)= 1495

^a Time variables indicate the degree to which turnover has changed for all facilities in the specified year.

* ≤ .05, ** ≤ .01, *** ≤ .001

Implications

The results indicate that the three workplace-based interventions examined as part of this study – WIN A STEP UP, “culture change” initiatives, and CCME Quality Indicator Initiatives – had some measurable positive impact on certain quality measures and/or turnover. WIN A STEP UP is associated with a decrease in pressure sores, while “culture change” initiatives and the CCME initiatives are associated with a decrease in the use of restraints.

The results of this study also indicate that the WIN A STEP UP workforce intervention has been effective in lowering nurse aide turnover in the facilities where it has been implemented. Facilities that participate in WIN A STEP UP have significantly lower turnover in the year that they participate in the intervention than facilities that have not participated in WIN A STEP UP, and we estimate that WIN A STEP UP has increased the probability of having turnover below the average turnover rate (118%) by 27 percentage points. Our analysis suggests that WIN A STEP UP is becoming more effective in lowering turnover rates among participating facilities. An earlier study of the effect of WIN A STEP UP on nurse aide turnover during 2002-2006 found that WIN A STEP increased the probability of having below-average turnover by 15 percentage points (Dill, Morgan, & Konrad, in press). We assume that inclusion of Coaching Supervision in 2004, in addition to improvements in the teaching of clinical, interpersonal, and communication skills to nurse aides, has improved the effectiveness of the WIN A STEP UP intervention in lowering turnover rates of nurse aides.

These results confirm that workforce interventions do have the potential to significantly improve quality and reduce nurse aide turnover, benefiting workers, employers, and residents.

Nurse aides benefit through improved compensation and employer recognition. Employers may benefit financially from lower turnover costs. A recent study estimated that the cost of recruiting and training one aide in a nursing home to be at least \$2500 per frontline worker (Seavey, 2004). If this is accurate, then facilities that are able to save money on reduced turnover costs may then be able to re-invest these funds in higher staffing levels, more timely and sustained training, and worker raises, creating a cycle of worker retention and stability. Given these even modest reductions in turnover can quickly add up to savings in the tens of thousands, freeing facility money for other quality or retention efforts.

Residents living in long-term care settings also benefit from improvement in quality of care and increased stability that comes from lower turnover of nurse aides. A recent study by Castle, Engberg, and Men (2007) shows a significant relationship between moderate to high turnover of nurse aides in nursing homes and poorer outcomes on quality of care measures, including use of physical restraints, catheter use, contractures, pressure ulcers, and psychoactive drug use. It is likely that when nurse aides stay in their positions for a longer period of time, they are able to better learn the needs of residents and provide a higher level of care. These findings serve to further link the connection between improved worker job satisfaction, retention and stability to important outcomes such as improved performance, enhanced care provision, and corresponding improvements in resident/client satisfaction (Brannon et al., 2007; Brannon et al., 2002; Cohen-Mansfield, 1995; Eaton, 2001; Ejaz, Noelke, Menne, & Bagaka, 2008; Feldman, 1994; Garland, Oyabu, & Gipson, 1988; Morgan & Konrad, 2008; Morgan et al., 2007; Noelker, Ejaz, Menne, & Jones, 2006).

As part of the ongoing commitment to nursing home quality of care and the nurse aide workforce in North Carolina, a new workplace-based initiative was developed and launched in North Carolina in 2006. NC New Organizational Vision Award (NOVA), initiated as a Better Jobs Better Care demonstration project, seeks to improve the direct care workforce in long-term care settings by recognizing employers who actively support and empower frontline staff by providing supportive workplaces, balanced workloads, training, and career development for workers. After the General Assembly approved the NC NOVA program, the North Carolina Division of Health and Human Services (NC DHHS) began implementing a voluntary special licensure designation for nursing homes, adult care homes and home care agencies. Successful applicant organizations that meet specified criteria are eligible to receive an NC NOVA special license designation.

In sum, three quality improvement initiatives in North Carolina have demonstrated a significant impact on quality and/or turnover. Overall, it appears that the investment that North Carolina is making in quality improvement initiatives is having a positive and significant impact on nursing home performance and the stability of the nurse aide workforce.

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