Memorandum

Date: January 21, 2004

From: Adele M. Childress, Ph.D., Program Official
Office of Extramural Programs, NIOSH, E-74

Subject: Final Report for Awareness of Publications for Grant 1R01OH004037-01.

To: William D. Bennett
Data Systems Team, Information Resources Branch, EID, NIOSH, P03/C18

The attached final report has been received from the principal investigator (PI) on the subject NIOSH grant. Since the PI allowably elected to provide an annotated list of publications, rather than a technical report, this material may not be suitable for forwarding to the National Technical Information Services (NTIS). However, if any portion is sent to NTIS, please let us know when a document number is known so that we can inform anyone who inquires about this final report. Any publications that are included with this report are highlighted on the list below.

Attachment
cc: Sherri Diana, EID, P03/C13

List of Publications

Gates D, Fitzwater E, Telintelo U: Using Simulations and Standardized Patients in Intervention Research. Clinical Nursing Research, in press, 2001

Gates, D., Fitzwater, E. & Succop, P. (2003). Predicting assaults against caregivers in nursing homes. Issues
in Mental Health Nursing, 24(8), 775-791.

Gates, Fitzwater & Deets. (2003). Testing the reliability and validity of the assault lag and violence prevention checklist, Journal of Gerontological Nursing 29(8), 37-45.

Gates, D., Fitzwater, E., Telintelo, S.t Succop, P. & Sommers, M.(2002) Preventing assaults by nursing home residents: Caregivers' knowledge and confidence -A Pilot Study. Journal of the American Medical Directors' Association, 3, 366-370.
*Dr. Gates was awarded $2000 for best contribution to JAMDA in 2002

Gates, Fitzwater & Telintelo.(2001) Using simulations to assess skill performance, Clinical Nursing Research 10(4), 387-400.

Title: Reducing Violence Against Nursing Home Caregivers
Investigator: Donna M. Gates
Affiliation: Cincinnati University
City & State: Cincinnati, OH
Telephone: (513) 558-3793
Award Number: 5R01OH004037-03
Start & End Date: 9/30/1999-9/29/2003
Total Project Cost: 405049
Program Area:
Key Words: health care workers, violence

Final Report Abstract:

Abstract

PROBLEM: The worker most commonly assaulted in the workplace is the nursing assistant (NA) in long-term care and the perpetrator is most often the patient (resident). There are physical, emotional and economical costs related to violence in healthcare settings.

PURPOSE: Test the effectiveness of a violence prevention intervention, based on Social Cognitive Theory to increase knowledge and self-efficacy, and reduce assaults against NAs from residents. The following seven hypotheses were generated to compare the intervention group to comparison group one week and six months after the intervention: H1: Intervention NAs will have a significant increase in perceived knowledge of their violence prevention skills

H2: Intervention NAs will have a significant increase in self-efficacy of their violence prevention skills H3: Intervention NAs will demonstrate an increase in violence prevention skills H4: Intervention NAs will have a decreased number of assaults H5: Age will be negatively related to the incidence of assaults

H6: Anger and stress will be positively related to the incidence of assaults.

H7: Number of residents assigned will be positively related to incidence of assaults

METHODS: Investigators conducted a quasi-experimental study; six nursing homes were randomly selected from all nursing homes with more than 100 beds in Hamilton County, Ohio. The six homes were randomly assigned to an intervention or comparison group. One hundred and thirty-eight NAs participated in three intervention and three comparison homes. Data was collected at baseline, 1 week after the intervention, and 6 months after the intervention. A baseline questionnaire was used to obtain information on demographics, employment, and past violence experience. At baseline, post-intervention and six months post-intervention the subjects completed the Knowledge and Self-efficacy survey, the State- Trait Anger Inventory (STAXI), Occupational Stress Inventory Revised (OSI-R), completed the Assault Log for 80 work hours and participated in a simulation exercise with a standardized actress. After baseline data collection was completed those in the intervention homes participated in nine, one hour weekly group sessions with a masters-prepared psychiatric nurse. The intervention

was based on Social Cognitive Theory and included opportunities for role plays, modeling, problem-solving and discussion.

T -tests and Poisson regressions were used to determine if significant changes in knowledge.. self-efficacy and assaults occurred in the intervention group. ANOVAs were used to identify relationships between assaults and anger, stress, strain; and workload.

Publications:

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Institution:	College of Nursing Procter Hall 3110 Vine Street University of Cincinnati Cincinnati, OH 45221-0038
Project Title:	Reducing Violence Against Caregivers in Nursing Homes
Project Date:	10/1/99 - 9/31/03
Principal Investigator	Donna Gates EdD, RN
Co-investigators:	Evelyn Fitzwater DSN, RN Paul Succop PhD Marilyn S. Sommers PhD, RN
Project Director:	Suzanne Telintelo MSN, RN
Sponsors:	National Institutes for Occupational Safety and Health
Grant number:	R01OHO4037 (NIOSH)
Report Date:	November 3, 2003

Table of Contents

Abstract

PROBLEM: The worker most commonly assaulted in the workplace is the nursing assistant (NA) in long-term care and the perpetrator is most often the patient (resident). There are physical, emotional and economical costs related to violence in healthcare settings.

PURPOSE: Test the effectiveness of a violence prevention intervention, based on Social Cognitive Theory to increase knowledge and self-efficacy, and reduce assaults against NAs from residents. The following seven hypotheses were generated to compare the intervention group to comparison group one week and six months after the intervention: **H1**: Intervention NAs will have a significant increase in perceived knowledge of their violence prevention skills
H2: Intervention NAs will have a significant increase in self-efficacy of their violence prevention skills
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H4: Intervention NAs will have a decreased number of assaults
H5: Age will be negatively related to the incidence of assaults
H6: Anger and stress will be positively related to the incidence of assaults.
H7: Number of residents assigned will be positively related to incidence of assaults

METHODS: Investigators conducted a quasi-experimental study; six nursing homes were randomly selected from all nursing homes with more than 100 beds in Hamilton County, Ohio. The six homes were randomly assigned to an intervention or comparison group. One hundred and thirty-eight NAs participated in three intervention and three comparison homes. Data was collected at baseline, 1 week after the intervention, and 6 months after the intervention. A baseline questionnaire was used to obtain information on demographics, employment, and past violence experience. At baseline, post-intervention and six months post-intervention the subjects completed the Knowledge and Self-efficacy survey, the State-Trait Anger Inventory (STAXI), Occupational Stress Inventory Revised (OSI-R), completed the Assault Log for 80 work hours and participated in a simulation exercise with a standardized actress. After baseline data collection was completed those in the intervention homes participated in nine, one hour weekly group sessions with a masters-prepared psychiatric nurse. The intervention was based on Social Cognitive Theory and included opportunities for role plays, modeling, problem-solving and discussion.

T-tests and Poisson regressions were used to determine if significant changes in knowledge, self-efficacy and assaults occurred in the intervention group. ANOVAs were used to identify relationships between assaults and anger, stress, strain, and workload.

FINDINGS: On the baseline survey 59% of the NAs reported that they are usually assaulted by residents once a week and16% reported that they are assaulted by residents every day. Additional questionnaire findings regarding lifetime prevalence rates while working as an NA in a nursing home included: 1) 51% reported that they have been injured by a resident, 2) 38% reported that they have received medical attention for an injury from a resident, 3) 10% reported that they have been assaulted by a co-worker, and 4) 4.3% reported that they have been assaulted by a visitor.

The mean number of assaults for the homes ranged from 1.57 to 8.42. A total of 624 assaults were experienced by 94 NAs; 44 NAs (29%) did not encounter any assaults. The mean number of assaults for NAs was 4.52 and 6.64 for NAs who were assaulted at least once. The number of assaults per caregiver during the 80 hours ranged from zero to 64. Thirty one injuries resulted from assaults (5%) during the 80 hours of work There was not a significant decrease in the assaults for the three intervention homes. However, data analysis excluding the third intervention home showed a significant decrease in the incidence of assaults ($p<.05$).

The post-intervention results from the ANOVAs showed a significant increase in the intervention subjects' perceived knowledge ($p<0.001$), self-efficacy ($p < 0.01$), and violence prevention skills ($p<0.05$). For the measurement six months after intervention results the ANOVAs again showed a significant increase in the intervention subjects' perceived knowledge ($p<.05$) However, there was no significant difference in the subjects' self-efficacy 6 months after the intervention nor increase in the use of violence prevention skills. At the second and third measurements, the intervention had no significant main effect on the number of assaults. However, an interaction effect between the intervention and number of pre-intervention assaults was found.

The intervention had a significant effect on those NAs who had less than 8 assaults pre-intervention ($p<0.001$) and no significant effect ($p>0.05$) on those who had more than 7 assaults on pre-intervention. Results from the regression analysis also found that the following covariates predicted the incidence of assaults at the first, second and third measurements: age ($p< .0001$), number of assigned residents ($p<.05$), and state anger ($<.001$).

SUMMARY: The rate of assaults from residents was not surprising and supported findings from previous studies. However, the lifetime prevalence rates of injury and medical care related to assaults from residents were unexpectedly high. The assault rates from co-workers and residents' family members were astounding when compared to other work settings. Although the intervention was significant in its ability to decrease assaults in the first 2 intervention homes, the inability to do so at study completion was probably due to two factors. First, the intervention homes had a much lower assault incidence at baseline making it more difficult to show a significant decrease. Secondly, during the intervention for the third nursing home, two major events occurred that affected the intervention: an attempt to unionize NAs and an unexpected state licensing inspection. More research is needed to study the incidence of all types of violence experience by NAs, as well as interventions to decrease the incidence of violence in this work setting.

The interaction effect at both the second and third measurements with the number of pre-intervention assaults identifies implications for practice and policy in terms of workload. In addition, the covariates related to the incidence of assaults identify that the risk factors for assaults in nursing homes is multi-faceted and requires interventions that not only address skills but address workload, work environment, and worker characteristics.

Significant Findings

Drs. Gates, Fitzwater, and Succop conducted a quasi-experimental study to test the effectiveness of a violence prevention intervention with 138 nursing assistants (NAs) in 3 intervention nursing homes and 3 comparison homes. The study aims were to:

1) increase NAs' violence prevention knowledge and self-efficacy to prevent assaults from residents
2) increase NAs' violence prevention skills when caring for residents
3) decrease the number of assaults against NAs from residents

The following four hypotheses were generated to compare the intervention group to comparison group one week after the intervention and six months after the intervention:

H1: Intervention NAs will have a significant increase in perceived knowledge of their violence prevention skills
H2: Intervention NAs will have a significant increase in self-efficacy of their violence prevention skills
H3: Intervention NAs will demonstrate an increase in violence prevention skills
H4: Intervention NAs will have a decreased number of assaults

On baseline measurement (before intervention), there were a total of 624 assaults experienced by 71% of the NAs. The mean number of assaults was 4.52 for all NAs and 6.64 for those who encountered at least one assault. The number of assaults per caregiver ranged from 0 - 64 and the mean number of assaults per nursing home ranged from 1.57 to 8.42.

The intervention was successful in increasing self-efficacy ($p<.05$), knowledge ($p<.05$) and skills ($p<.05$) at the measurement one week after intervention. There was no significant main effect on decreasing the number of assaults for the three intervention homes. However, data analysis excluding the third intervention home showed a significant decrease in the incidence of assaults ($p<.05$). Although the intervention was significant in its ability to decrease assaults in the first 2 intervention homes, the inability to do so at study completion could be due to two factors. First, the intervention homes had a much lower assault incidence at baseline (3.41 vs. 7.44) making it more difficult to show a significant decrease. Secondly, during the intervention for the third nursing home, two major events occurred that affected the NAs' participation in the intervention: an attempt to unionize NAs and an unexpected state licensing inspection.

An interaction effect between the intervention and number of pre-intervention assaults was found at the second and third measurements. The intervention had a significant effect on those NAs who had less than 8 assaults pre-intervention ($p<0.001$) and no significant effect ($p>0.05$) on those who had more than 7 assaults on pre-intervention.

The intervention was successful in increasing knowledge ($p<.05$) at the measurement 6 months after the intervention, but was not successful in increasing self-efficacy and skills, and there was no significant main effect on decreasing the number of assaults for the three intervention homes. Again the intervention had a significant effect on those NAs who had less than 8 assaults pre-intervention ($p<0.001$) and no significant effect ($p>0.05$) on those who had more than 7 assaults on pre-intervention

Usefulness of Findings

The intervention, based on Social Cognitive Theory and traditional educational methods, was effective in reducing assaults for many NAs. However, non-traditional approaches are needed to work with NAs who may be experiencing large number of assaults.

Implications from this study are important for practice, policy and future research. Nursing home administrators and management personnel need to appreciate the extent of the problem and the significant consequences related to assaults against NAs in these work settings. Moreover, this study does not address the consequences related to verbal abuse which is also considered violent behavior and is equally upsetting to NAs (Gates et al, 1999). The findings of this study highlight the need for nursing homes to institute workplace violence policies and prevention programs that raise awareness about the problem and provide education and training for direct care staff. Future research efforts need to focus on determining additional worker characteristics and environmental factors that influence violence in nursing homes.

Residents in nursing homes rely daily on their NAs to provide them with physical and emotional support. Because NAs provide most of the hands-on care, nurses and physicians also must depend on these staff caregivers to provide good care and be aware of early changes in residents' conditions. Health care professionals, administrators and policy makers need to understand and appreciate that caring for NAs will result in better resident outcomes and that their leadership is mandatory to make a difference for both the care of the NAs and the residents. Although the incidence of violence and other stressors cannot be eliminated in nursing homes, they can be decreased. They should not be tolerated or accepted as "part of the job". To do so devalues the staff caregiver and is likely to result in job dissatisfaction, burnout and turnover.

Scientific Report

Background

Nursing homes and personal care facilities rank second in the incidence of injuries and illnesses for industries with over 100,000 annual cases and rank the highest in incidence of assaults (Bureau of Labor Statistics, 2002).NAs provide 90% of the direct care to residents who reside in nursing homes. More than 90% of these NAs are women and a disproportionate number are of minority background. Most have a high school degree or lower educational level and come from low-income families. Yet, these NAs provide care for some of the most fragile, complicated and challenging patients in our healthcare system today. Daily NAs are exposed to many physical and emotional stressors on the job; however, little is known about how these stressors are related to occupational strain and injury in these workers.

Workplace violence can seriously impact the employer, the employees and the residents. There have been attempts by investigators to identify the costs of work-related assaults in the healthcare industry. Lanza and Miller (1989) estimated the costs of 78 hospital incidents to be $38,000 including staff time, police time, and victim costs. Yassi (1994) estimated that 242 injuries to healthcare workers in a hospital accounted for 8, 026 hours of lost time and approximately $76,000 in lost wages and medical care. At this time, there is nothing in the literature that examines the cost of workplace violence to the long-term care industry.

For the employer effects include the costs of medical care for injuries such as black eye injuries, headaches, sore or broken jaws, lacerations or bruising, fractures, bite wounds, and temporary hearing loss. In addition to the costs related to medical care and lost workdays, there are adverse outcomes related to personnel changes from employee burnout and turnover. There can be additional costs related to psychological care, unexplained absenteeism, property damage, decreased productivity, increased security, litigation, increased workers' compensation and personnel changes. Studies have found that healthcare workers who experience physical assault experience both short-term and long-term emotional reaction, including anger, sadness, frustration, anxiety, depression, irritability, fear, apathy, self-blame, and helplessness (Gage & Kingdom, 1995; Gates, Fitzwater & Meyer, 1999; Lanza, 1992). Miller, Reesor, McCarrey & Leikin (1995) found that workplace violence affects nurses' self-perception which can result in feelings of powerlessness and burnout. Evers, Tomic, and Brouwers (2001) found that physical and psychological aggression has an effect on emotional exhaustion for those staff caring for the elderly. .

Specific Aims

Gates, Fitzwater and Succop conducted a quasi-experimental study to test the effectiveness of a violence prevention intervention with nursing assistants (NAs) in 3 intervention nursing homes and 3 comparison homes. The original study aims were:

1) increase NAs' violence prevention knowledge and self-efficacy to prevent assaults from residents
2) increase NAs' violence prevention skills when caring for residents
3) decrease the number of assaults against NAs from residents

Additional aims included in the study were:

4) identify the incidence and prevalence of violence against NAs working in nursing homes
5) identify the relationship between the characteristics of the NAs (age, trait anger, state anger, and occupational stress) and the incidence of assaults

Publications

Published

Gates, D., Fitzwater, E. & Succop, P. (2003). Predicting assaults against caregivers in nursing homes. *Issues in Mental Health Nursing, 24(8),* 775-791.

Gates, Fitzwater & Deets. (2003). Testing the reliability and validity of the assault log and violence prevention checklist, *Journal of Gerontological Nursing 29(8),* 37-45.

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Gates, Fitzwater & Telintelo.(2001) Using simulations to assess skill performance, *Clinical Nursing Research 10(4),* 387-400.

Publications planned for future Gates, D., Fitzwater, E. & Succop, P. *Preventing violence against nursing home staff: An intervention study.*

Presentations

Fitzwater, E., Gates, D., Telintelo, S., & Sommers, M. September 11, 2003. *Intervention to reduce nursing home resident assaults on staff.* Greater Cincinnati Gerontological Nursing Nursing Association Annual Conference. Drake Conference Center, Cincinnati, OH. Keynote Address

Gates, Fitzwater, & Succop, *Violence against caregivers: An intervention study*, NORA 2003: Working Partnerships - Research to Practice, sponsored by NIOSH, Washington D.C., June 24, 2003, Poster

Gates & Fitzwater, *Reducing assaults against caregivers in nursing homes: an intervention study.* Epidemiology and Biostatistics divisional seminar, Department of Environmental Health. University of Cincinnati. May, 2003 Invited speakers

Fitzwater, E., Gates, D., Telintelo, S., Succop, P., Sommers, M. (March 22, 2003). *Influence of anger on stress, coping, and job Strain: Nursing assistants in nursing homes.* Work, Stress, and Health Conference. Toronto, Canada. Sponsored by NIOSH and American Psychological Assn. Poster

Gates, Fitzwater, Succcop & Sommers, *Relationships of stressors, strain and anger to caregiver assaults*, Work and Stress Conference, Co-sponsored by NIOSH and APA, Toronto, Canada, March 20, 2003

Fitzwater, E., Gates, D., Telintelo, S. *Nursing assistants in nursing homes: Prevention skills, knowledge and self-Efficacy in managing violent resident behaviors*. Gerontological Society of American, 54th Annual Conference, Boston, MA. Nov. 22, 2002. Paper

Fitzwater, E. & Gates, D. *Effects of an Intervention to Reduce and Manage Violence Against in Nursing Homes.* Gerontological Assn of America, 54th Annual Scientific Conference, Chicago Hilton, Chicago, Ill. November 18, 2002. Paper

6) identify the relationship between the number of residents assigned and the incidence of assaults

For the aims, the following hypotheses were generated and tested one week after the intervention and six months after the intervention:

H1: Intervention NAs will have a significant increase in perceived knowledge of their violence prevention skills
H2: Intervention NAs will have a significant increase in self-efficacy of their violence prevention skills
H3: Intervention NAs will demonstrate an increase in violence prevention skills
H4: Intervention NAs will have a decreased number of assaults
H5: Age will be negatively related to the incidence of assaults
H6: Anger and stress will be positively related to the incidence of assaults.
H7: Number of residents assigned will be positively related to incidence of assaults

Methods

Investigators conducted a quasi-experimental study; six nursing homes were randomly selected from all nursing homes with more than 100 beds in Hamilton County, Ohio. The six homes were randomly assigned to an intervention or comparison group. One hundred thirty-eight subjects, or 63% of all full-time NAs participated in the study. Ninety-four percent of the subjects were women, 67% were African-American, 25% Caucasian, and 6% were Asian. The mean age was 35.98 years (n=137, range = 18-65, SD=11.10) and the mean years of education for the subjects was 11.76 years (n= 137, range = 1-16, S.D = 1.74).

Data was collected at baseline, 1 week after the intervention, and 6 months after the intervention. For logistical reasons the investigators worked with one intervention home and one comparison home at a time. Investigators met initially with subjects in groups during their work hours to describe the study, expectations for participation, and how and when incentives would be given for participation. At this meeting the subjects read and completed the consent forms and completed the Demographic and Employment Questionnaire, the Knowledge and Self-efficacy survey, the State-Trait Anger Inventory (STAXI), and the Occupational Stress Inventory-Revised (OSI-R). After the initial meeting, all subjects carried and completed the Assault Log for 80 work hours. After completion of the Assault logs, the NAs participated in a simulation exercise with a standardized actress. After baseline data collection was completed those in the intervention homes participated in nine, one hour weekly group sessions with a masters-prepared psychiatric nurse. The intervention was based on Social Cognitive Theory and included opportunities for role plays, modeling, problem-solving and discussion.

Results and Discussion

One hundred thirty eight subjects completed a demographic and employment questionnaire at baseline. Results from this questionnaire include the following:

- Mean age was 35.98, with a range of 18 to 65 years of age
- 73% of the subjects represented a minority group, with African-Americans at 67%
- Mean years of education was 11 years
- 94% were women
- 59% reported that they are physically assaulted by residents once a week
- 16% reported that they are physically assaulted by residents every day
- 51 % reported that they had received an injury from a resident while working as an NA during their lifetime
- 38 % reported that they had received medical attention for an injury from a resident while working as an NA during their lifetime
- 10 % reported that they had been physically assaulted by a co-worker while working as NA during their lifetime
- 4.3% reported that they had been physically assaulted by a family member while working as NA during their lifetime.
- 56% reported they *always* report assaults to supervisors, while 15% reported they *seldom* report assaults.

Aims 1, 2 and 3:

- *Measurement #2: One week after the intervention (Table 1)*

Results from the ANOVAs showed a significant increase in the intervention subjects' perceived knowledge ($p < 0.001$), self-efficacy ($p < 0.01$), and violence prevention skills ($p<0.05$) thus fully supporting hypotheses 1, 2, and 3.

Hypothesis 4 was partially supported. After the first four homes, the intervention showed a significant main effect on decreasing the incidence of assaults ($p< 0.05$) for the subjects in the two intervention homes. However, after including the third intervention and comparison homes in the analysis, the intervention had no significant main effect on the number of assaults ($p=0.61$). An interaction effect between the intervention and number of pre-intervention assaults was found. The intervention had a significant effect on those NAs who had less than 8 assaults pre-intervention ($p<0.001$) and no significant effect ($p>0.05$) on those who had more than 7 assaults on pre-intervention.

- *Measurement #3: Six months after the intervention (Table 2)*

Results from the ANOVAs again showed a significant increase in the intervention subjects' perceived knowledge ($p<.05$) from the pre-intervention measurement, thus supporting hypothesis 1. However, hypothesis 2 was not supported since there was no significant difference in the subjects' self-efficacy 6 months after the intervention. Although the NAs in the intervention group did continue to show an increase in the use of violence prevention skills, it was not enough to show a significant difference from the comparison group ($p=0.12$) and thus support hypothesis 3.

Hypothesis 4 was partially supported. The intervention had no significant main effect on the number of assaults ($p=0.61$). Again, an interaction effect between the intervention and number of pre-intervention assaults was found. The intervention had a significant effect on those NAs who had less than 8 assaults pre-intervention ($p<0.001$) and no significant effect ($p>0.05$) on those who had more than 7 assaults on pre-intervention. Results from the regression analysis again found that the following covariates predicted the incidence of assaults: age ($p< .0001$), number of assigned residents ($p<.05$), and state anger ($<.001$).

In conclusion, the intervention was effective in its ability to significantly increase the intervention subjects' perceived knowledge, self-efficacy, and skill performance as measured one week after the intervention. Although the intervention subjects felt significantly more knowledgeable after 6 months than the comparison subjects, they did not differ significantly in their self-efficacy. Likewise, whereas intervention subjects demonstrated a significant increase in skill use during the simulation one to two weeks after the intervention, the skill level was not sustained over the 6 month period. These findings were not surprising and support our belief that the care of aggressive residents involves a high level of critical thinking and clinical skills. A booster intervention that reinforced prior learning would likely increase the effectiveness of violence prevention education on self-efficacy and skills.

The intervention had mixed results in terms of its effectiveness in reducing the number of assaults. When comparing the intervention subjects to the comparison subjects, there was no significant main effect at the second and third measurements. There are two possible reasons for the lack of significance at the second measurement which occurred a week after the intervention. First, at the baseline measure the intervention subjects had a significantly lower mean number of assaults ($p>.05$) than comparison subjects making it more difficult for the intervention to show a significant decrease in number of assaults. Second, the decrease in assaults at the second measurement was significant ($p<.05$) when data was analyzed after the first four homes, two intervention and two comparison homes. There are two possible explanations for the loss of statistical significance when adding the last two homes, one intervention and one comparison, to the analysis. During the intervention for the third intervention home, two major events occurred that influenced participation in our intervention. There was an unexpected licensing inspection from the state and an attempt to unionize NAs. Both of these events resulted in increased anxiety for management and staff and had a negative affect on attendance at the intervention.

The interaction effect at both the second and third measurements with the number of pre-intervention assaults identifies important questions related to the workload, the work environment, or characteristics of the NA. The

number of residents assigned was related to the number of assaults at the second and third measurements, indicating that workload is likely to be an important predictor of assault. These results could simply be due to the statistical fact that an increase in the number of interactions with residents is likely to result in more chances for assault. The relationship might also suggest that NAs are more apt to deliver care in a more hurried and time pressured manner when assigned a large number of residents. A rushed and hurried approach is likely to cause residents to become more agitated and aggressive, thus increasing the caregiver's chance of assault. In addition, when one is under extreme time pressure, it becomes very difficult to appreciate the need to apply skills that often require the caregiver to slow their pace. For example, our violence prevention skills include using distraction, time-out and validation. These activities are likely to be seen as "impossible" to the NA with a heavy resident assignment.

Aim 4

On baseline measurement (before intervention), there were a total of 624 assaults experienced by 71% of the NAs (Gates, Fitzwater & Succop, 2002). The mean number of assaults was 4.52 for all NAs and 6.64 for those who encountered at least one assault. The number of assaults per caregiver ranged from 0 - 64 and the mean number of assaults per nursing home ranged from 1.57 to 8.42. The types of assaults and the caregiving activities being performed while assaulted are shown in Tables 3 and 4.

Thirty one injuries (5%) resulted from assaults during the 80 hours of work and the incidence rate for injury was 23 injuries per 100 NAs in only 80 hours of work. Unfortunately it was beyond the scope of this study to capture the type of injuries, whether the injury required medical or psychological care, and if the injury resulted in lost work time.

Aim 5

As part of this current intervention study the investigators collected data from the NAs to identify the relationship between assaults and the following variables: a) role stressors b) occupational strain, and d) anger. The Occupational Stress Inventory-Revised (OSI) was used to assess role stressors and occupational strain (Osipow, 1999). Role stressors included role overload, insufficiency, ambiguity, responsibility, boundary and physical environment. Occupational strain variables included the following types: vocational, interpersonal, psychological and physical.

The State Trait Anger Inventory (STAXI) was used to assess for anger (Speilberger, 1999). Anger is a subjective emotional state and this emotional state may give rise to aggression, which is a verbal or physical act of violence. Speilberger (1999) states that whereas persons with high State Anger are currently experiencing relatively intense angry feelings, persons with high Trait Anger frequently experience angry feelings and often feel that they are treated unfairly by others. Speilberger's Trait Anger scales correlate significantly with Hostility Scales, including the Buss-Durkee Hostility Inventory and the Minnesota Multi-phasic Personality Inventory (Speilberger, 1999).

Poisson regression was done to identify the predictors for the 624 assaults recorded before the intervention (Table 5). The following variables were found to be positively related to the incidence of assaults: age, number of residents assigned, state anger, trait anger, role insufficiency, and role ambiguity. Duration of employment and previous training (current facility or any previous violence prevention training) were not related to the number of assaults. The differences between those NAs who had no assaults and those NAs that experienced at least one assault were also analyzed using t-tests. Variables that were significantly different between the two groups included the following: age (assaulted group was younger), vocational strain (assaulted group was higher), physical strain (assaulted group was higher), state anger (assaulted group was higher) and trait anger (assaulted group was higher). Duration of employment was not found to be significantly different between the two groups.

Results from the regression analysis on the second and third measurements found that the following covariates again predicted the incidence of assaults: age ($p < .01$), number of assigned residents ($p < .001$), and state anger ($<.001$). Assaults were associated with a decrease in age and an increase in number of assigned residents and state anger.

Aim 6

The number of residents assigned was related to the number of assaults at first, second, and third measurements, indicating that workload is likely to be an important predictor of assault. These results could simply be due to the statistical fact that an increase in the number of interactions with residents is likely to result in more chances for assault. The relationship might also suggest that NAs are more apt to deliver care in a more hurried and time pressured manner when assigned a large number of residents. A rushed and hurried approach is likely to cause residents to become more agitated and aggressive, thus increasing the caregiver's chance of assault.

Additional Findings

There were two serendipitous, but interesting findings from the study. First, there was a significant positive correlation ($r=.34$, $p=.004$) between the age of the NA and the number of residents assigned each day. Second, logistic regression found that those NAs who participated in the intervention were more likely ($p<.05$) to have remained in their job at completion of the study, which lasted 10 months.

Conclusions.

The high rate of physical assaults from residents was not surprising and supported the findings from other studies. Likewise, it was not surprising that many assaults go unreported. The lifetime prevalence rates of injury and medical care related to assaults from residents were unexpectedly high and require further investigation. In addition, ten percent of the NAs responded "yes" on a survey question that asked whether they had ever been physically assaulted by a co-worker during their lifetime working as an NA. Four percent of the NAs responded "yes" on a survey question that asked whether they had ever been physically assaulted by a family member during their lifetime working as an NA. These assault rates results are astounding, especially when comparing these rates to other workers' experiences with co-worker assaults. Analysis of survey data from 8,000 women in the U.S. indicates that lifetime coworker victimization rates for women are about 1.1% and annual victimization rate is .1% (BLS, 2001).

The intervention was effective in its ability to significantly increase the intervention subjects' perceived knowledge, self-efficacy, and skill performance as measured one week after the intervention. Although the intervention subjects felt significantly more knowledgeable after 6 months than the comparison subjects, they did not differ significantly in their self-efficacy. Likewise, whereas intervention subjects demonstrated a significant increase in skill use during the simulation one to two weeks after the intervention, the skill level was not sustained over the 6 month period. These findings were not surprising and support our belief that the care of aggressive residents involves a high level of critical thinking and clinical skills. A booster intervention that reinforces prior learning would likely increase the effectiveness of violence prevention education on self-efficacy and skills.

The intervention had mixed results in terms of its effectiveness in reducing the number of assaults. When comparing the intervention subjects to the comparison subjects, there was no significant main effect at the second and third measurements. There are two possible reasons for the lack of significance at the second measurement which occurred a week after the intervention. First, at the baseline measure the intervention subjects had a significantly lower mean number of assaults ($p<.05$) than comparison subjects making it more difficult for the intervention to show a significant decrease in number of assaults. Second, the decrease in assaults at the second measurement was significant ($p<.05$) when data was analyzed after the first four homes, two intervention and two comparison homes. There are two possible explanations for the loss of statistical significance when adding the last two homes, one intervention and one comparison, to the analysis. During the intervention for the third intervention home, two major events occurred that influenced participation in our intervention. There was an unexpected licensing inspection from the state and an attempt to unionize NAs. Both of these events resulted in increased anxiety for management and staff and had a negative affect on attendance at the intervention.

The interaction effect at both the second and third measurements with the number of pre-intervention assaults identifies an important question with implications for practice and policy. Was the inability to decrease the assault incidence due to the number of residents being cared for, the work environment, or characteristics of the NA? The number of residents assigned was related to the number of assaults at the second and third measurements, indicating that workload is likely to be an important predictor of assault. These results could

simply be due to the statistical fact that an increase in the number of interactions with residents is likely to result in more chances for assault. The relationship might also suggest that NAs are more apt to deliver care in a more hurried and time pressured manner when assigned a large number of residents. A rushed and hurried approach is likely to cause residents to become more agitated and aggressive, thus increasing the caregiver's chance of assault. In addition, when one is under extreme time pressure, it becomes very difficult to appreciate the need to apply skills that often require the caregiver to slow their pace. For example, our violence prevention skills include using distraction, time-out and validation. These activities are likely to be seen as "impossible" to the NA with a heavy resident assignment.

Since state anger was also related to the number of assaults at both second and third measurements, there appears to be relationships between the NAs' characteristics and assault incidence. Researchers have shown that negative moods detract from a person's ability to concentrate fully on a job task, making them more vulnerable to accidents and poor performance (Barling et al, 1996; Duffy & McGoldrick, 1990). Speilberger (1999) states that persons with high state anger are currently experiencing relatively intense, angry feelings. Angry persons are often frustrated and such frustration is likely to result in how and when the NA delivers care to the residents. For example, frustrated and hostile NAs' voices might be louder and their movements might be rougher, causing a resident to respond in an aggressive manner. The following cycle is proposed. An angry NA unwittingly provokes an aggressive response from a resident, leading to a complicated caregiving situation. The event increases the anger and anxiety of the NA, decreases their cognitive ability to analyze the situation and depersonalize the resident's action, and decreases their ability to respond in a calm and proper manner (Gates et al, 2003). Although the intervention did include opportunities for the NAs to share emotions regarding aggressive residents, emphasis was not focused on strategies to effectively decrease assaults by managing one's anger.

The inverse relationship between age and number of assaults also indicates that the NAs' characteristics are important for understanding the interactions that take place between caregiver and resident. It would be beneficial to compare the caregiving approaches of NAs of different age groups and anger scores to identify variables that increase the risk of assault (Gates, Fitzwater & Succop, 2003).

It was encouraging to find that those NAs in the intervention group were more likely to remain in their job at study completion than those in the comparison group. During informal discussions during the study the intervention participants described how the "attention from the researchers made them feel that persons were interested in their work" by offering them education and support. The participants also made positive statements regarding how the intervention was aimed at benefiting them and some even voiced optimism that maybe things might change. The intervention strategies dictated by Social Cognitive Theory provided opportunities for individual and group support. Support at work has been found to be a major predictor of job satisfaction and commitment, and appears that turnover in nursing homes might also be moderated by support at work (Eisenberger et al,1997; Ellis & Miller, 1993; Frone,2000 ; Kickul & Posi, 2001; Parkes & von Rabenau, 1993)

The significant correlation between age and number of residents assigned is an interesting finding; duration of employment as a NA or duration of employment at the current facility did not predict assaults or number of residents assigned. This finding mirrors the earlier discussion about age and assaults and the need to observe the caregiving skills of older NAs. Important questions remain. For example, how do older NAs provide care for a greater number of residents, but encounter less assaults? And why do some managers assign more residents to older NAs?

Table 1 Pre- and post-intervention means for the **first and second measurement**

	N	Pre-intervention Mean	SD	Range	Post -Intervention Mean	SD	Range
Knowledge							
Intervention	51	3.56	0.84	1.6-5.0	4.33	0.58	2.6-5.0
Comparison	44	3.68	0.67	1.8-5.0	3.93	0.66	2.8-5.0
Perceived Self-efficacy							
Intervention	51	3.74	0.83	1.3-5.0	4.28	0.66	2.0-5.0
Comparison	44	3.54	0.60	2.5-5.0	3.77	0.73	2.0-5.0
Violence Prevention Skills							
Intervention	53	47%	18%	12%-97%	60%	20%	21%-100%
Comparison	47	47%	16%	22%-87%	54%	18%	12%-100%
Assaults							
Intervention	53	3.41	4.21	0-14	2.58	3.56	0-13
Comparison	49	7.44	12.62	0-67	4.32	6.62	0-38

Table 2 Pre- and post- intervention means for the **first and third measurement**

	N	Pre-Intervention Mean	SD	Range	6 months Post- Intervention Mean	SD	Range
Knowledge							
Intervention	42	3.57	0.88	1.6-5.0	4.32	0.59	2.8-5.0
Comparison	33	3.62	0.52	2.6-4.6	3.89	0.67	2.4-5.0
Perceived Self-efficacy							
Intervention	42	3.70	0.88	1.3-5.0	4.04	0.72	2.0-5.0
Comparison	33	3.47	0.61	2.0-5.0	3.91	0.57	3.0-5.0
Violence Prevention Skills							
Intervention	39	47%	18%	17%-97%	52%	15%	17%-83%
Comparison	31	47%	16%	25%-87%	47%	14%	21%-79%
Assaults							
Intervention	40	3.50	4.19	0-13	1.65	2.77	0-10
Comparison	30	4.36	4.93	0-25	3.06	3.43	0-15

Table 3. Percent of Total Assaults by Assault Types

Type of Assault	Percent
Hitting or punching	51%
Grabbing, pinching or pulling hair	40%
Kicking	27%
Scratching or biting	23%
Spitting	11%
Throwing or hitting with object	9%

Note: The percentages do not add up to 100% since many assaults included more than one type of assault

Table 4. Caregiving Activities when Assaulted

Type of Caregiving Activity	Percent
Dressing or changing	43%
Turning or transferring	26%
Bathing	19%
Feeding	12%
Toileting	9%
Other	9%

Note: The percentages do not add up to 100 since assault incidents included more than one type of activity

Table 5. *Poisson Regression Model for Assaults*

Variable	Degrees of Freedom	Estimate	Standard Error	Chi Square	P
Number of Residents	1	-1.9716	0.5694	11.988	0.0005
Age	1	0.0039	0.0008	21.744	0.0001
State Anger	1	0.0452	0.0049	86.599	0.0001
Trait Anger	1	0.0222	0.0047	22.475	0.0001
Role Insufficiency	1	0.0097	0.0037	6.789	0.0092
Role Ambiguity	1	0.0217	0.0039	30.128	0.0001
		0.0113	0.0044	6.644	0.0099

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Fitzwater & Gates, *C is for Caring*. Presentation given during awards luncheon for nursing assistants, sponsored by the University of Kentucky Sanders Brown Institute, Summer Series on Aging, July 11, 2002. Invited speakers.

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Fitzwater & Gates, *Violence against nursing assistants in nursing homes*, Ohio Healthcare Association, Columbus, OH, October 17, 2001, Invited speakers

Gates & Fitzwater, *Reducing violence against caregivers in nursing homes*, Drake Hospital, Cincinnati, OH, August 7, 2001, Invited speakers

Abstracts under review

Gates, Fitzwater & Succop *Violence against nursing assistants in nursing homes*, CDC 7th World Conference on Injury Prevention and Control, Vienna, Austria, June 2004.

Gates, Fitzwater & Succop, *Violence against nursing assistants: An intervention study*. American Medical Director's Association. Phoenix, Arizona, March, 2004.

Fitzwater & Gates, *Increasing violence prevention skills for nursing assistants in nursing homes,* American Medical Director's Association. Phoenix, Arizona, March, 2004.

Appendix

Published Manuscripts