Resident-to-Resident Mistreatment
Evaluation of a Staff Training Program in the Reduction of Falls and Injuries

ABSTRACT
Resident-to-resident elder mistreatment (R-REM) occurs frequently in long-term services and support settings. The purpose of the current study was to evaluate the effect of a R-REM training program for nursing and other frontline staff on resident falls and injuries in a cluster randomized trial of units within four nursing homes. Interview and observational data from a sample of 1,201 residents (n = 600 and n = 601 in the usual care and intervention groups, respectively) and staff were collected at baseline and 6 and 12 months. A generalized linear model was used to model the falls/injuries outcome. The net reduction in falls and injuries was 5%, translating to 10 saved events per year in an average-sized facility. Although the result did not reach statistical significance due to low power, the findings of fall prevention associated with implementing the intervention in long-term care facilities is clinically important.

BACKGROUND
Falls and Injuries
Falls among older adults are a significant health concern, increasing the risk of mortality, morbidity, and disability. In 2015, falls among older adults cost Medicare alone more than $31 billion in direct medical costs (adjusted for inflation; Burns, Stevens, & Lee, 2016). An increasing number of individuals with dementia (Zimmerman, Sloane, & Reed, 2014), who are likely to have some degree of mobility limitation (Williams et al., 2005), translates into the need for fall prevention strategies specifically designed for this cognitively impaired population (Téri, Huda, Gibbons,}

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R-REM is likely a contributing factor to falls and injuries in LTSS settings. Because R-REM is not always observed, it is not possible to link definitively these incidents to injurious outcomes. However, a program targeting R-REM, including removal of etiological factors contributing to R-REM and directly and indirectly to falls and injuries, such as crowding and obstacles obstructing egress (a putative contributing factor in R-REM), is posited to affect the overall rate of such instances. Interventions to enhance the delivery of health care for chronically ill residents and improve the environment to lessen the risk of falls have been recommended (Wood-Nartker, Guerin, & Beuschel, 2014).

**Staff Training and Behavior Modification**

Frontline direct care staff have expressed need for further education and training for community and institutional elder abuse (Hagen & Sayers, 1995; Trevitt & Gallagher, 1996). Staff training and education have been demonstrated to be successful in ameliorating agitated behaviors manifested by individuals with dementia (Jeon et al., 2012). Nonpharmacological approaches to address abuse (Hirst, 2002) and disruptive behaviors in older adults with dementia have been documented, including behavioral interventions (Cohen-Mansfield, 2004). The antecedents, behaviors, and consequences approach has been identified as a practical applied framework for development of appropriate interventions for disruptive behaviors (Douglas, James, & Ballard, 2004; Teri et al., 2005). This method supports the behavioral mapping technique, which describes the behavior(s) (including the existing environmental factors) in a specific measurable way to establish the etiology and ramifications of the behavior(s). Interventions can then be developed, taking into account the detailed assessment of the behavior(s), as well as individuals’ preferences. Working with the authors of some of these approaches and techniques, aspects of these programs were integrated into the R-REM intervention evaluated and presented herein.

**CONCEPTUAL MODEL OF THE LONGITUDINAL INTERVENTION OUTCOME**

Teresi et al. (2016) developed a conceptual model for use in longitudinal research on elder abuse. This model was based on the results of a 2015 U.S. National Institutes of Health-sponsored conference on elder abuse prevention. Specifically, R-REM was considered a stressful event in the model, predicting distal outcomes such as falls and injuries and affective well-being. Behavior disorder is causally related to R-REM and also acts as a mediator in the relationship between R-REM and distal outcomes. The rationale for inclusion of falls and injuries as the primary outcome is that (a) they are linked directly and indirectly to R-REM because R-REM can result in falls and injuries, which may not always be observed; (b) reduction in environmental conditions inducing R-REM and leading to falls was a targeted element in the intervention; and (c) falls and injuries are associated with quality of life outcomes and societal costs.

**AIM**

The aim of the current study was to examine the longitudinal effects of a three-module program targeting frontline staff, particularly certified nursing assistants (CNAs), to implement best practices related to R-REM in LTSS settings on falls and injuries. It was hypothesized that frequency of falls and injuries would decrease as a result of training.

**METHOD**

**Design**

The intervention with nursing staff was tested in nursing homes. A cluster randomized trial design with randomization of intervention units and matched comparison (i.e., usual care) units within facilities was implemented.

**Randomization**

Six nursing homes were selected randomly from among 21 nursing homes with ≥250 beds in two metropolitan New York regions. Five of six facilities agreed to participate; however, midway through the study and data collection, one facility experienced a change in administration and was dropped from the analyses due to lack of ability to implement the intervention and collect falls outcome data. Forty units (20 intervention and 20 usual care) were randomized. Mean cluster size was 30.03 residents (SD = 6.34; range = 12 to 45 residents). Units were randomly assigned to the intervention group, and the remainder to the usual care group. Case mix indices and unit type data demonstrated group equivalence.

**Description of the Intervention**

Staff on the intervention units received training and implementation protocols, whereas individuals on the usual care units did not receive the training modules and protocols. The intervention targeted R-REM training of CNAs primarily, but was appropriate for other nursing and social work staff. The training modules were: (1) Recognition and Risk Factors, (2) Management, and (3) Implementation of Guidelines. Trainers were from backgrounds in nursing, nursing home administration, education, and social work. The content of the three sessions is described elsewhere (Ellis et al., 2014; Teresi, Ramirez, Ellis, et al., 2013) and presented briefly below.

**Recognizing R-REM.** Module 1 provides evidence about personal and environmental risk factors, such as crowding and obstacles. The putative role of cognitive impairment in R-REM is also discussed. Physical, psychological, and sexual R-REM is covered.

**Management of R-REM.** Module 2 presents (a) a review of the previous session, (b) a film on management of
older adult mistreatment, and (c) the SEARCH (Support, Evaluate, Act, Report, Care Plan, Help to Avoid) approach to R-REM management (Ellis et al., 2014). A 25-minute film introduces three scenarios, portrayed by actors. Multidisciplinary experts are featured, and each skit is discussed in terms of staff interventions and outcomes that are more or less optimal.

Implementation of Best Practices Related to R-REM. Module 3 comprises review material and presentation of implementation methods and forms and reporting guidelines. Methods for completion of the intervention forms are illustrated using filmed vignettes for practice and confirmation of implementation skills. A review of practice sheets and implementation guidelines is also included.

Procedure
An extensive training manual was prepared to ensure fidelity. Senior research staff (G.B., R.M.) performed the training. Each session was scheduled twice for all nursing shifts, including night and weekend staff. Make-up sessions were held. All project staff involved in training and data collection were blinded regarding intervention group status. Baseline interviews were collected prior to trainers delivering the intervention.

Three hundred twenty-five CNAs were trained on Module 1, 317 CNAs on Module 2, and 322 CNAs on Module 3 (implementation and use of the incident tracking sheets). The majority of CNA staff (approximately 14 staff members per unit) were trained.

Data Collection
Data for falls and injuries were collected via chart review and from incident/accident reports on an ongoing basis. In addition, residents who were capable cognitively self-reported their falls during the past 1 year. Resident and staff interviews for questionnaire data were performed by interviewers at three time points, baseline and 6 and 12 months, using a computer-assisted personal interview system. Data were collected with rolling enrollment; in-person and electronic medical record data were collected between July 2008 and July 2013. The study was approved by a university Institutional Review Board and the participating nursing homes that had an IRB.

Measures
Demographic variables from resident chart review included age, race, educational attainment, and length of stay in the facility. In addition, the following staff and resident measures were administered.

The Institutional Comprehensive Assessment and Referral Evaluation (INCARE; Golden, Teresi, & Gurland, 1984) was used to collect covariate data. Assessment of the following are included: (a) arousal, (b) level of alertness, (c) simple commands, (d) cognitive functioning (e.g., orientation, memory, calculation, attention), (e) range of motion and ambulation, (f) performance activities of daily living (PADL), (g) affect, and (h) behavior.

The PADL (Kuriansky & Gurland, 1976) is a 27-item scale that measures an individual’s lack of ability to perform activities of daily living associated with eating, dressing, and grooming, such as putting on, buttoning, and unbuttoning a sweater; guiding a spoon to the mouth; and combing hair independently. Cronbach’s alpha estimate for the current sample was 0.940 at baseline, 0.937 at 6-month follow up, and 0.873 at 12-month follow up. The scale was scored in the impaired direction. The ordinal alpha was 0.944; McDonald’s omega total was 0.945.

Falls/Injuries Outcome
Objective data concerning resident falls and injuries were collected. The data used for evaluation of the primary outcome and R-REM reports included the following.

Minimum Data Set (MDS)/Patient Review Instrument (Morris et al., 1990). Data were collected 3 months prior to the start of the study and continuously until the end of data collection. The MDS is administered annually; a subset is collected quarterly and when a significant change occurs. All records approximately 3 months (range = 1 to 3 months) prior to the baseline interview were collected for each individual. Each subsequent full, annual, quarterly, or change in status MDS was collected up to and including 3 months after the close of data collection at the facility. There are four items related to falls and hip fractures during the previous 30- and 180-day periods in the MDS.

Accident and Incident Reports. The New York State Department of Health (DOH) mandates accident and incident reports. Federal regulations require immediate reporting of alleged violations of abuse, mistreatment, and neglect, including injuries of unknown origin, to the facility administrator and, in accordance with state law, to the DOH. An incident/accident report documents the circumstances surrounding falls, fractures, lacerations, and other accidents.

Resident Chart Review. Nursing, social services, and activities notes, as well as case planning conference reports, were reviewed for occurrences of R-REM, falls, and injuries. A review of residents’ charts was performed for the period 6 months prior to baseline through the end of data collection.

This multi-source approach yielded the best classification of the incidence
of falls, fractures, and injuries. Another exploratory source of falls data was from residents who were capable cognitively of self-report. They reported falls over the past 1 year. These data were used in exploratory analyses of the relationship between falls and R-REM, given that it was posited that residents would be able to report more unobserved falls related to R-REM.

**Statistical Analysis**

Preliminary analyses were performed to determine whether the groups were balanced. Two-tailed tests of significance were performed. Binomial tests were conducted on dichotomous variables, Poisson tests on non-binomial (e.g., count) data, and t tests on ordinal data, adjusting standard errors for clustered data within facilities; p values are reported because the design did not permit randomization at the level of the individual. Group differences in total scores were examined using a linear mixed (fixed and random effects) model for effect estimation. Clustering within units was modeled as a random effect.

A generalized linear model was performed using SAS Proc Glimmix version 9.4 with an autoregressive covariance structure. Some imbalance in groups was observed for cognition and PADL. Because of collinearity with PADL measures, only the cognition measure was included in the analyses. The general model is:

\[
\eta_{ij} = \log(\pi_{ij}/(1-\pi_{ij})) = \alpha + \mu_i + \mu_j + \beta_c \times \text{Cdiagp} + \beta_t \times \text{time}
\]

where \( \eta \) is the logit link, \( \pi_{ij} \) is the expected probability of a fall for a resident of group \( i \) and unit \( j \), \( \alpha \) is the intercept, \( \mu_i \) is the fixed effect for group, \( \mu_j \) is the random effect of unit with mean \( = 0 \), \( \beta_c \) is the slope of the cognitive measure (Cdiagp; pro-rated for missing data and treated as time varying), and \( \beta_t \) is the slope of time for group \( i \) (Aitkin, Anderson, Francis, & Hinde, 1989; Lawless, 1987). The expected probability of a fall/injury for residents of group \( i \) and unit \( j \) is:

\[
\pi_{ij} = \frac{e^{\eta_{ij}}}{1+e^{\eta_{ij}}}
\]

**RESULTS**

Agreement to participate was obtained from five of six facilities, yielding a facility response rate of 83%. However, one facility did not complete study implementation and longitudinal falls data were not collected; thus, the final response rate was 67%. The final power calculations showed that four facilities would be sufficient to yield the requisite sample sizes to detect moderate but not small effects (Figure).

The sample represented 19% of large facilities (250+ beds) in the regions. Comparison data were obtained from the Medicare website of the U.S. Department of Health and Human Services. Quality measures, inspection reports, and staffing data for the sample were compared to those from New York State and nationally. The review showed that generalizability was most likely beyond local or regional areas.

For the four facilities, including in the denominator all residents who did not participate regardless of the reason, the overall response rate was 81.2% (1,201/1,479); 81.4% (600/737) in the usual care group and 81% (601/742) in the intervention group.

The final analytic sample was 1,201 residents, with 601 in the intervention and 600 in the usual care groups. Missing data were observed over time for some measures requiring resident and/or staff interviews, in part due to illness, cognitive decline, or availability. However, little missing data were observed longitudinally for the primary outcome, falls and injuries, because data were collected from accident/incident reports, chart data, and the MDS.

There were no significant demographic differences between the usual care and intervention groups (Table 1). At baseline, residents in both groups were primarily female, White, and widowed. Intervention and usual care group residents were of equivalent age, mean = 85.2 years (SD = 8.9 years) and mean = 85.7 years (SD = 8.8 years), respectively.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Usual Care Group (n = 600)</th>
<th>Intervention Group (n = 601)</th>
<th>Total (N = 1,201)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>444 (74)</td>
<td>443 (73.7)</td>
<td>887 (73.9)</td>
<td>0.909</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
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<tr>
<td>Black, non-Hispanic</td>
<td>87 (14.5)</td>
<td>106 (17.6)</td>
<td>193 (16.1)</td>
<td>0.103</td>
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<tr>
<td>Hispanic</td>
<td>92 (15.3)</td>
<td>93 (15.5)</td>
<td>188 (15.4)</td>
<td>0.736</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
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<tr>
<td>Married</td>
<td>77 (12.8)</td>
<td>72 (12)</td>
<td>149 (12.4)</td>
<td>0.588</td>
</tr>
<tr>
<td>Never married</td>
<td>114 (19)</td>
<td>106 (17.6)</td>
<td>220 (18.3)</td>
<td>0.538</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Age (years)</td>
<td>85.7 (8.8)</td>
<td>85.2 (8.9)</td>
<td>85.4 (8.85)</td>
<td>0.385</td>
</tr>
<tr>
<td>Education (years)</td>
<td>12.09 (3.85)</td>
<td>12.34 (4.05)</td>
<td>12.21 (3.95)</td>
<td>0.317</td>
</tr>
<tr>
<td>Resident measures (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range of motionb (488, 401, 889)</td>
<td>6.72 (7.19)</td>
<td>6.99 (7.22)</td>
<td>6.84 (7.20)</td>
<td>0.574</td>
</tr>
<tr>
<td>Feeling Tone Questionnaire totalc (521, 466, 987)</td>
<td>54.70 (11.26)</td>
<td>54.68 (12.38)</td>
<td>54.69 (11.79)</td>
<td>0.978</td>
</tr>
<tr>
<td>Care Dementia Diagnostic Scaled (566, 546, 1,112)</td>
<td>7.15 (4.51)</td>
<td>8.55 (4.62)</td>
<td>7.84 (4.61)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PADL scale totale (368, 315, 683)</td>
<td>1.62 (3.59)</td>
<td>2.90 (5.44)</td>
<td>2.21 (4.58)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Extended Depression Scalef (347, 225, 572)</td>
<td>6.52 (5.72)</td>
<td>7.19 (6.21)</td>
<td>6.78 (5.92)</td>
<td>0.186</td>
</tr>
<tr>
<td>Fear of Falling Scalerg (335, 225, 560)</td>
<td>0.90 (1.60)</td>
<td>0.96 (1.58)</td>
<td>0.92 (1.59)</td>
<td>0.662</td>
</tr>
<tr>
<td>Prorated score over time</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Observed affecth (599, 597, 1,196)</td>
<td>6.71 (2.48)</td>
<td>6.84 (2.55)</td>
<td>6.78 (2.51)</td>
<td>0.378</td>
</tr>
<tr>
<td>Observed behaviori (599, 597, 1,196)</td>
<td>5.40 (2.28)</td>
<td>5.22 (2.24)</td>
<td>5.31 (2.26)</td>
<td>0.174</td>
</tr>
<tr>
<td>Observed totalj (599, 597, 1,196)</td>
<td>9.41 (3.30)</td>
<td>9.23 (3.19)</td>
<td>9.32 (3.25)</td>
<td>0.349</td>
</tr>
<tr>
<td>Staff informant measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disturbing behaviorsk (594, 586, 1,180)</td>
<td>9.74 (8.15)</td>
<td>10.11 (8.22)</td>
<td>9.92 (8.18)</td>
<td>0.435</td>
</tr>
<tr>
<td>Mood—alll (590, 584, 1,174)</td>
<td>0.80 (5.73)</td>
<td>0.78 (5.55)</td>
<td>0.79 (5.64)</td>
<td>0.962</td>
</tr>
<tr>
<td>Observation schedule PADL—assistance m (576, 577, 1,153)</td>
<td>11.39 (7.72)</td>
<td>14.22 (6.84)</td>
<td>12.81 (7.43)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Note. PADL = performance activities of daily living.

b 0 to 21, higher score indicates greater impairment.
c 25 to 96, higher score indicates greater impairment.
d 0 to 17, higher score indicates greater cognitive impairment.
e 0 to 29, higher score indicates greater impairment.
f 0 to 29, higher score indicates greater depression.
g 0 to 7, higher score indicates greater fear of falling.
h 0 to 18, higher score indicates greater observed affective disorder.
i 0 to 29, higher score indicates greater observed behavior disorder.
j 3 to 44, higher score indicates greater disorder.
k 0 to 47, higher score indicates greater behavior disorder.
l Standardized sum from –9.22, higher score indicates greater mood disorder.
m 0 to 20, higher score indicates greater need for assistance.
Equivalence was observed for the majority of baseline covariates (Table 1). However, the intervention group showed cognitive (Care Dementia Diagnostic Scale, mean = 8.55, SD = 4.62) and functional impairment levels (PADL, mean = 2.90, SD = 5.44) of a slightly greater magnitude compared to the usual care group (mean = 7.15, SD = 4.51; mean = 1.62, SD = 3.59, respectively). Because of collinearity, only the cognitive covariate was included in the multivariate analyses described. Because of missing data on the falls/injuries variable for 49 residents in the usual care group and 48 residents in the intervention group, a reduced sample was used in the analyses (n = 551 usual care group; n = 553 intervention group). The groups were equivalent at baseline.

**Relationship of R-REM to Falls**

The range of R-REM was 10.4% to 31.2% for the sample of four facilities. The range of falls across facilities using the formally reported rates was 18.2% to 31.1%. The R-REM rates were higher when self-reported than formally reported because of the longer time frame for self-reports and the possibility of reporting falls not documented or observed formally. Among those who could self-report (n = 893), 41.7% of those involved in versus 33.6% of those not involved in R-REM experienced a fall in the past 2 weeks. Smaller differences in the number of falls were observed when examining only falls formally reported using MDS data. In high R-REM rate facilities, the fall rate was 21.9% versus 18.4% in low R-REM rate facilities.

**Effect of the Intervention on Falls**

Although the result was not significant (p = 0.235), it was in the expected direction, with fewer falls observed in the intervention group over time and post training. It is possible to estimate the number of falls saved. The observed baseline rate of falls in the usual care group was 0.240 and 0.244 in the intervention group: the respective rates at 1-year follow up were 0.235 and 0.180. The model-based net reduction in falls was estimated at 5%. Thus, for the average 200-bed nursing home, the number of saved falls in 1 year was estimated at 10.1 (Table 2).

Power calculations show that this effect size would be detectable (significant) only for very large sample sizes. For 80% power, the sample size required to detect a net endpoint difference of 5% under different scenarios regarding reliability of falls data and clustering ranges from 1,094 to 1,678 residents per group. As shown, the sample size was underpowered to detect effect sizes of this magnitude. However, a savings of 10 falls per year is a clinically important effect associated with the intervention. This result is close to the effect size, which reflected significant fall reduction in a similar adequately powered study of a cluster randomized trial of a training intervention to reduce falls (Teresi, Ramirez, Remler, et al., 2013).

Sensitivity analyses were performed including all residents as randomized who had at least one fall datum, ignoring the covariate adjustment (n = 553 intervention; n = 551 usual care). The estimates were almost identical (β = –0.022; p = 0.264). Across various sensitivity analyses, the estimates were similar, with a 1.5% to 2% reduction in falls in the usual care group versus a 5% to 7% reduction in the intervention group. The net reduction was between 5% and 6% and the savings in falls per year between 9.4 and 11.

**DISCUSSION**

Studies have evaluated the impact of education programs addressing aggressive behaviors in nursing homes. Generally, the focus has been on resident-to-staff aggression (Chrzescijanski, Moyle, & Creedy, 2007; Hagen & Sayers, 1995; Narevic et al., 2011), although in one study (Pillmer & Hudson, 1993), resident-to-staff and staff-to-resident aggression were examined. Overall, there was a decrease in the number of aggressive incidents.

The risk factors and explanatory mechanisms for falls among nursing home residents often include a combination of individual- and environmental-level elements. The conceptual model used as the frame-
work to guide the current intervention evaluation study places falls as a distal outcome resulting from R-REM. Findings supported the hypothesis of a reduction in falls/injuries associated with the intervention group status. CNAs’ training on recognition, reporting, and management of R-REM was a contributing factor in falls reduction. It is estimated that approximately 10 falls were saved in larger long-term care facilities as a result of the intervention, a finding that is deemed clinically significant given the impact of falls on morbidity and mortality among institutionalized older adults (Deandrea et al., 2013). The reduction of falls and falls-related injuries is fundamental for resident safety and care quality in LTSS settings.

Plausible consequences of falls are multiple, including physical and psychological decline and mortality. Fractures, lacerations, abrasions, and other injuries require onsite attention, hospitalization, or both. Similarly, falls (with or without consequential injury) can decrease residents’ quality of life as well as functional ability. The fear of R-REM–related falls and injuries may deter individuals from participation in social and leisure activities, increasing the likelihood for isolation, dependency, and physical frailty (Jørstad, Hauer, Becker, Lamb, & ProFaNE Group, 2005; Suzuki, Ohyama, Yamada, & Kanamori, 2002). Thus, an R-REM intervention aimed at reducing falls and injuries may confer potential safety and quality-of-life benefits to residents, in addition to positive financial implications (in terms of cost savings) for long-term care institutions.

A cluster randomized trial in residential care facilities provided evidence that an interdisciplinary, multi-level (resident, staff, and environment) prevention program that included nursing staff training reduced the number of residents who fell and the total number of falls (Jensen, Lundin-Olsson, Nyberg, & Gustafson, 2002). Similarly, the findings of the current cluster randomized trial support the hypothesis that falls associated with R-REM can be prevented with staff training. Nursing homes are required to provide 12 hours of training per year to nursing staff, and evidence-based training is critical to effecting practice changes (Barba & Fay, 2009; McConnell et al., 2009). It is recommended that CNA training on recognition, reporting, and management of R-REM be integrated into the training curricula provided by long-term care facilities. It is thus advocated that all nursing personnel be aware of and familiar with the same training. RNs are responsible for leadership in LTSS settings and their knowledge and support of R-REM assessment as a falls prevention intervention is essential for successful implementation and outcomes. In most settings, RNs serve as educators for the facility.

As identified in the current study, training in R-REM can result in a decrease in the number of falls by residents in nursing homes. The R-REM training results in nurses and care staff having the skills to prevent and knowledge of behaviors that can lead to falls. Many physical behaviors of aggression, such as grabbing, kicking, hitting, and pushing, are examples of R-REM that could lead to falls. In the current study, a relationship between R-REM and falls was observed, with higher fall rates reported among residents who were also involved in R-REM compared with those who were not involved in R-REM. When nursing and care staff are aware of these behaviors and the possible outcomes, they are able to develop care plans to help avoid occurrences of such incidents.

**STRENGTHS AND LIMITATIONS**

A methodological strength in the assessment of falls and injuries in long-term care was using a multi-source, triangulation approach. This multi-source approach yielded the best classification of the outcome; however, the possibility of underreporting still exists. In that context, the findings reported in the current study may represent a conservative estimation.

The study has several limitations. Even with random assignment, it is not possible to control for unmeasured factors in the intervention group that may have led in part to the reduction in falls, such as cultural or environmental factors. Because of low variation in falls/injuries and R-REM rates in the small sample of facilities, it was not possible to examine definitively the relationship of R-REM to falls. However, preliminary evidence examining self-reported falls outcome and classification of facilities into high and low fall rates based on formal reporting showed a relationship between R-REM and falls, with more falls associated with R-REM. In addition, because this was a randomized controlled trial, the main study hypothesis examined was whether the training program had an impact on falls.

It is also not possible to pinpoint the underlying mechanisms by which fall reduction was achieved through the intervention. Mechanisms may include enhanced staff vigilance, environmental modifications, and individualized behavior interventions taught to staff. It could be that training: (a) increased overall sensitivity and vigilance by staff related to injury prevention; (b) resulted in removal of R-REM–inducing factors, such as obstacles preventing egress, often observed to result in R-REM; (c) resulted in individual behavioral interventions that mitigated behaviors associated with falls; (d) reduced falls related directly to R-REM because many events are unobserved; or (e) achieved fall reduction through a combination of factors.

Future research should examine ways to ultimately prevent R-REM and reduce factors leading to R-REM, such as obstacles, crowding, and small spaces that prevent egress, and thus indirectly affect fall and injury rates. In addition, future research should examine high and low R-REM facilities in terms of falls and injuries.
CLINICAL IMPLICATIONS

Attention should be paid to R-REM, which potentially endangers long-term care residents. Identification of potential incidents that lead to falls can add to the reduction of the number of falls. Training of staff in recognition of R-REM is important to improve identification and management of R-REM and reduce consequences for older adults living in LTSS settings. Although it is important to recognize the caveats associated with the current study, a training program aimed at R-REM recognition and treatment modalities is associated with a fall/injury reduction.

To the authors’ knowledge, this is the first intervention study targeting R-REM and the first to address frontline nursing assistant staff. Dissemination of this program could have a positive impact on (a) protecting vulnerable individuals, (b) reducing falls and injuries, (c) enhancing staff recognition and knowledge about how to intervene in resident-to-resident altercations, and (d) ultimately reducing costs of care through fall and injury prevention.

CONCLUSION

The current study examined the impact of training on frontline staff as a way to anticipate and intervene appropriately in R-REM events that ultimately reduces episodes of falls in LTSS settings. A reduction of approximately 10 falls per year was estimated in an average size (i.e., 200 bed) facility exposed to the intervention compared with facilities not exposed. Evidence of such an effect supports implementation of the R-REM program in LTSS settings. Given the dramatic, negative outcomes that can result from falls, as well as the falls reduction goals most facilities have, this training holds great promise. There is likely an application of this same approach to older adults in assisted living and acute care settings where R-REM may also occur.

REFERENCES


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