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Title: Measuring Restorative Care Provided by Nursing Assistants: Reliability and Validity of the Restorative Care Behavior Checklist

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Abstract: Purpose: The purpose of this study was to test the reliability and validity of the Restorative Care Behavior Checklist (RCBC), which is an observed measure of restorative care activities performed by nursing assistants.
Design and Methods: This study involved a single one time observation and completion of survey data among nursing assistants working in nursing homes. A total of 386 participants from 8 nursing homes were included in this study. In addition to completion of the RCBC during a 15 minute observation of care interactions, demographic data were obtained, and participants completed a paper and pencil survey that included: self-efficacy, outcome expectations, knowledge of restorative care, and job attitude. Reliability testing was based on person separation reliability and inter-rater reliability. Validity testing was based on evidence of the unidimensionality of the measure, the fit of the items using Rasch analysis, and evidence of convergent validity.
Results: There was support for the reliability of the RCBC with a person separation reliability of 0.77 and inter-rater reliability with .80 to 100% agreement on each of the care behaviors. Support for validity was provided based on evidence of unidimensionality and a good fit of the items. There was not support for convergent validity.

Implications: The development and psychometric testing of the RCBC is an important first step in the observational assessment of a restorative care activities performed by NAs, or other caregivers of older adults, living in long term care settings.

To Whom it May Concern,

We are submitting the manuscript, Measuring Restorative Care Provided by Nursing Assistants: Reliability and Validity of the Restorative Care Behavior Checklist, to be considered for publication in Nursing research. All authors have contributed to this manuscript and none of the authors has a conflict of interest. We are sending the Copyright Transfer form under separate cover. Please let us know if additional information is needed.

Sincerely,
Barbara Resnick, PhD,CRNP,FAAN,FAANP

Measuring Restorative Care Provided by Nursing Assistants: Reliability and Validity of the Restorative Care Behavior Checklist

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Measuring Restorative Care Provided by Nursing Assistants: Reliability and Validity of the Restorative Care Behavior Checklist

Abstract

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Design and Methods: This study involved a single one time observation and completion of survey data among nursing assistants working in nursing homes. A total of 386 participants from 8 nursing homes were included in this study. In addition to completion of the RCBC during a 15 minute observation of care interactions, demographic data were obtained, and participants completed a paper and pencil survey that included: self-efficacy, outcome expectations, knowledge of restorative care, and job attitude. Reliability testing was based on person separation reliability and inter-rater reliability. Validity testing was based on evidence of the unidimensionality of the measure, the fit of the items using Rasch analysis, and evidence of convergent validity.

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Implications: The development and psychometric testing of the RCBC is an important first step in the observational assessment of a restorative care activities performed by NAs, or other caregivers of older adults, living in long term care settings.

Since the Omnibus Budget Reconciliation Act (OBRA) of 1987 (Omnibus Budget Reconciliation Act OBRA, 1987) mandated that residents attain and maintain their highest level of function, nursing homes have attempted to develop and implement restorative care programs. Ultimately the goal of these programs is to change the philosophy of care in long-term care from one in which nurses provide care that creates dependency, to one that focuses on the restoration and/or maintenance of physical function, and helps the older adult to compensate for functional impairments so that the highest level of function is obtained.

Most of the prior research testing the outcomes of restorative care programs (Remsburg, Armacost, Radu, & Bennet, 1999; Resnick, Allen, & Ruane, 2002) has mainly focused outcomes on resident behaviors including such things as functional performance, behavior, and quality of life. The studies have not addressed treatment fidelity issues or attempted to consider if restorative care activities were truly occurring in the resident / nursing assistant interaction. Without such an evaluation, it is impossible to optimally evaluate the effectiveness, or lack of effectiveness, of restorative care activities.

The few studies that did consider the restorative care activities of NAs based this on subjective reports from the NAs of time spent in restorative care activities (Resnick, Allen, & Ruane, 2002; Resnick, Simpson, Bercovitz et al., 2006). These subjective reports may be biased by social desirability and an inclination to present oneself in a manner that will be viewed favorably by others. It is also possible that NAs are not sure what constitutes restorative care activities and therefore may include the independent activities of a resident (i.e., time in walking by an independently ambulatory resident).

This is not restorative care as the NA has done nothing to encourage the walking to occur (i.e., no restorative care intervention).

To improve our understanding of restorative care as performed by NAs, and to be able to test interventions to increase restorative care activities in long term care sites, an objective measure of restorative care behaviors is needed. The purpose of this study was to test the reliability and validity of a newly developed objective measure of restorative care behavior, the Restorative Care Behavior Checklist (RCBC).

Restorative Care Behaviors of Nursing Assistants

Under the current reimbursement system, facilities are able to capture costs related to the provision of restorative care for their Medicare skilled residents if they document and demonstrate adherence to the required components of the program. These components include providing: (1) two or more nursing rehabilitation activities for 15 or more minutes a day for six or more of the last seven days; and (2) nursing interventions that assist or promote the resident's ability to attain his or her maximum functional potential, promote the resident's ability to adapt and adjust to living as independently and safely as possible, and focus on optimal physical, mental and psychosocial functioning. Restorative care activities do not include procedures or techniques carried out by qualified therapists. Specifically, restorative care activities focus on functional tasks and physical activity that NAs encourage residents to perform. These activities include bed mobility, transfers, ambulation, bathing, dressing, hygiene, eating, use of personal assistive devices, communication, and exercise. Restorative care on the part of the NA involves encouraging the resident to participate in the activity at his or her highest level of ability.

Factors that Influence Restorative Care Behaviors of NAs

The implementation of restorative care behaviors among NAs is strongly influenced by their beliefs in their abilities to perform these activities in light of the many challenges noted (e.g., staffing issues and resident refusal to perform activities), and their beliefs in the benefit of restorative care for the residents. Social cognitive theory, specifically the theory of self-efficacy (Bandura, 1986), has been used to explain behavior in work environments and to guide interventions toward learning new occupationally related skills (Frayne & Geringer, 2004; McDonald & Siegall, 1992; Wolfe, Nordstrom, & Williams, 1998). The theory of self-efficacy suggests that the stronger the individual's self-efficacy and outcome expectations, the more likely it is that he or she will initiate and persist with a given activity. Self-efficacy theory incorporates self-efficacy expectations, which are the individuals' beliefs in their capabilities to perform a course of action to attain a desired outcome; and outcome expectations, which are the beliefs that a certain consequence will be produced by personal action.

Efficacy expectations are dynamic and are both appraised and enhanced by four mechanisms (Bandura, 1997): (1) enactive mastery experience, or successful performance of the activity of interest; (2) verbal persuasion, or verbal encouragement given by a credible source that the individual is capable of performing the activity of interest; (3) vicarious experience, or seeing like individuals perform a specific activity; and (4) physiological and affective states such as pain, fatigue or anxiety associated with a given activity. Both self-efficacy and outcome expectations have been associated with behavior. Specifically, Bandura postulated that individuals were more likely to act on their self-efficacy expectations when they believed that their actions would result in

valued outcomes (Bandura, 1997) than if the outcome anticipated was not perceived to be important.

Self-efficacy based interventions have been used to improve job performance in professional nursing (Mackenzie & Peragine, 2003; Manojlovich, 2005) and in changing behavior among NAs with regard to oral care of older adults (Wardh, Hallberg, Berggren, Andersson, & Sorensen, 2003), feeding of residents(Chang, 2005) and recognition and protection against patient assault(Gates, Fitzwater, & Succop, 2005; Gates, Fitzwater, Telintelo, Succop, & Sommers, 2004). In addition, self-efficacy based interventions for NAs have been shown to be effective with regard to restorative care activities. In a single site study testing the effectiveness of a restorative care intervention (Resnick, Simpson, Bercovitz et al., 2006; Resnick, Simpson, Galik et al., 2006) self-efficacy expectations for restorative care of NAs accounted for 31% of the variance in performance of restorative care activities ($F=7.7$, $p<.05$, beta .60).

Self-efficacy related to employment activities has repeatedly been associated with job satisfaction and job performance (Cohrs, Abele, & Dette, 2006; Judge & Bono, 2001; Judge, Bono, & Locke, 2000) and can improve job satisfaction and performance. (Jex, Bliese, Buzzell, & Primeau, 2001; Wolfe, Nordstrom, & Williams, 1998). A study testing a self-efficacy based pre-employment telemarketing-training program resulted in strengthening self-efficacy expectations related to job performance and those exposed to the intervention remained employed significantly longer then the control group(Wolfe, Nordstrom, & Williams, 1998). Self-efficacy based interventions such as verbal persuasion and education about care related activities resulted in improved job satisfaction and decreased turnover in NAs (Finnema et al., 2005; Parsons, Simmons,

Penn, & Fulough, 2003; van Weert, Van Dulmen, Spreeuwenberg, Bensing, & Ribbe, 2005). We anticipate, therefore, that self-efficacy based interventions with NAs related to restorative care can increase their participation and proficiency in restorative care activities with residents and thereby increase their job satisfaction.

Observational Measurement

Observational measurement is believed to be a more accurate method of collecting data on behavioral activities compared to self-reports and proxy-reports (Kupek, 2002). There are, however, challenges associated with observational measures that create measurement error and can impact the reliability and the validity of the measure. The most common among these are the response of the subject to being observed (i.e. subject reactivity) and observer judgment. Certainly the physical presence of an observer may impact the behavior or performance of the subject, and may reduce the level of activity in the subjects as much as 50% (Tsai, 2003), or enhance or improve behavioral performance (Leeders, Sherman, & Nagaraja, 2000).

The most effective way to reduce participant reactivity to an observer is to conceal the observers from the participants. From a practical and ethical perspective, observers can be trained to conduct their own behavior in an unobtrusive manner while collecting data in order to reduce subject reactivity. Physical appearance, body language, facial expression and tone of voice should all be considered as factors that will influence the level of observer obtrusiveness. Another strategy that can be used to reduce participant reactivity is to delay collecting behavioral data until after the observer has been in place in the observational setting for a few minutes. This allows time for the

subject to become habituated to the presence of an observer (Waltz, Strickland, & Lenz, 2004).

Observer judgment also can affect the reliability of an observational measure. Observer drift can occur when observers make subtle unconscious changes in how they score categories of behavior over time. The reliability of an observational measure can be improved through checklist scoring. The checklist forces the observer to look for the presence or absence of particular behaviors rather than using a rating scale in which the observer may have to infer an intensity or magnitude of a behavior (Grimes & Schulz, 2002).

Recognition of the challenges associated with observational measures must be balanced with the noted benefits. Objective measures are likely to reduce subjective bias and the likely inflation of scores when subjective reports are used. Observational measures also give researchers a method to quantify a behavioral interaction (Mahoney et al., 1999), and are especially useful for non-communicative or minimally communicative populations such as young children and the cognitively impaired (Bridges-Parlet, Knopman, & Thompson, 1994; Oleski & Kim, 2002). The RCBC was developed using the known tenets of observational measurement in an attempt to capture evidence of the performance of restorative care behaviors among NAs. Specifically, it was our goal to develop a measure that would capture restorative care activities on the part of nursing assistants, limit the risk of reactive responses on the part of the NAs, and minimize bias and error on the part of those doing the observations.

Methods

Design

A total of 10 research evaluators were trained to evaluate residents and NAs as part of a randomized controlled trial testing a restorative care intervention (Res-Care Study) (Resnick, Simpson, Bercovitz et al., 2006). The evaluators included a heterogenous group of individuals: two had nursing backgrounds, and the remaining had some research experience with regard to data collection but were not health care providers and had not previously worked in nursing homes. Training of the evaluators in the completion of the Restorative Care Behavior Checklist was done by an experienced nurse researcher and followed guidelines developed in a manual of procedures (Appendix A).

Reliability and validity testing of the RCBC was evaluated using a sample of 386 NAs who consented to participate in the Res-Care Study. This data was from the baseline (pre-randomization) component of the larger study testing the effectiveness of a the Res-Care Intervention. Following recruitment, the NAs were given a survey to complete which included the following measures: Self-efficacy for Restorative Care Activities; Outcome Expectations for Restorative Care Activities; a Theoretical Test of Restorative Care Knowledge; and a Job Attitude Scale. The survey was completed as a paper and pencil test by the NAs and return to a locked box at the receptionist's desk within the facility. Following completion of the survey, the evaluator set up a time with the NA to complete the observed measure.

Reliability Testing

Reliability of the RCBC was based on person separation reliability (i.e. internal consistency)(Smith & Smith, 2004) and inter-rater reliability (Waltz, Strickland, & Lenz, 2004). Inter-rater reliability was evaluated using a random sample of 10 observations of

the NAs that were completed by two evaluators observing the same NA/resident interaction.

Validity Testing

Validity of the RCBC was based on evidence of the internal structure of the measure using Rasch analysis (American Educational Research Association, 1999; Smith & Smith, 2004) and evidence of convergent validity (American Educational Research Association,1999). Based on the theory of self-efficacy and known sources of information that influence self-efficacy expectations (e.g., performance of the behavior, verbal encouragement) it was hypothesized that age, gender, ethnicity, education and experience as an NA would influence knowledge of restorative care, self-efficacy and outcome expectations, and all of these variables would be related to performance of restorative care activities by the NAs (Bandura, 1995; Resnick & Simpson, 2003).

Sample

This analysis included the baseline data on 386 NAs recruited from 8 nursing homes for the Res-Care study (Resnick, Simpson, Bercovitz et al., 2006). Eligibility to participate in the Res-Care Study was based on working in the facility for at least 6 months, working day or evening shifts, and being able to read and write English. The average age of the NAs was 40.9 (SD=11.9) with a range from 20 to one individual who was 81 years of age. The majority of the participants were female (93%), African American (88%), and 90% had at least 12 years of education (Table 1). The mean years of experience as NAs among these individuals was 10.8 (SD=8.7), with a range of years from 8 months to 46 years. Thirty-six percent (n=138) had prior training related to restorative care nursing beyond their basic NA education.

Measures

In addition to the demographic data obtained and the completion of the RCBC, the following measures were included in the survey: Self-efficacy for Restorative Care Activities; Outcome Expectations for Restorative Care Activities; Restorative Care Knowledge; and Job Attitude.

The Restorative Care Behavior Checklist (RCBC). The RCBC is an observational measure that focuses on whether or not the NA implemented a restorative care philosophy during care related interactions with a resident (e.g. bed mobility encouraged at highest functional level). The observer indicates if: Activity is not performed during observation; Restorative Care Performed (i.e. NA allowed/ encouraged resident to perform or participate in at least a portion of the activity); or Restorative Care Not Performed (i.e. NA performed care without allowing/ encouraging resident to participate). The RCBC identifies 10 care related activities: bed mobility, transfers, mobility, bathing of upper and lower extremities, hygiene, eating, use of assistive devices, exercise, and communication. Evidence of restorative care behaviors in each of the functional areas are defined and serve as a guide to the observer as he/she completes the measure (Appendix A).

Appendix A provides the description of restorative care behaviors across all care activities. The description of the restorative care behaviors was initially created by two advanced practice nurses with experience in restorative care, and then revised through pilot testing with a group of 10 evaluators (Resnick & Simpson, unpublished data). The definitions were clarified until there was at least 90% agreement during three different observations using the RCBC among the ten evaluators. Scoring of the RCBC is done by

calculating the total number of restorative care activities done/total number of observed activities.

NAs Self-efficacy for Restorative Care (NASERC). The NAs self-efficacy for restorative care activities is a 10-item measure that focuses on the NAs confidence in performing specific restorative care activities. Prior use of the measure demonstrated evidence of internal consistency with alpha coefficients of 0.72, test-retest reliability with no difference in scores between testing time points ($F=1.9$, $p=.18$). As anticipated, based on the theory of self-efficacy (Bandura, 1986), self-efficacy for restorative care activities accounted for 31% of the variance in performance of restorative care activities ($F=7.7$, $p<.05$, beta 0.60) (Resnick & Simpson, 2003).

NAs Outcome Expectations for Restorative Care (NAOERC). The NAs outcome expectations for restorative care activities is a 9 item measure that focuses on the NAs beliefs in the outcomes associated with performing restorative care activities. Prior use of the measure demonstrated evidence of internal consistency (alpha coefficient of 0.82) and test-retest reliability. There was no difference in scores between two week testing time points ($F=0.76$, $p=.39$) (Resnick & Simpson, 2003).

Theoretical Testing of Restorative Care Knowledge. This is a 15-item paper and pencil multiple choice exam in which NAs are tested on knowledge of restorative care activities. Prior use of the test (Resnick & Simpson, 2003) provided evidence of test-retest reliability with a Pearson correlation of 0.85, $p<.05$ when the test was given at two week intervals. Evidence of validity was based on contrasted groups. Although not statistically significant, those who performed restorative care activities regularly scored better on the test than those who did not (10.8 versus 9.6 correct).

Job Attitude Scale. This is a 17-item measure that addresses the NAs attitudes toward five important components that are believed to influence work satisfaction: pay factors, organizational factors, task requirements, and job status. Prior use of the Job Attitude Scale in a sample of 286 participants resulted in findings similar to those found when the Minnesota Satisfaction Scale was used. The advantage of the Job Attitude Scale over the Minnesota Satisfaction Scale is that the former measure focuses more on care related activities (Helmer, Olson, & Heim, 1995).

Data Analysis

Reliability Testing

Inter-rater reliability testing of the RCBC was performed using percent agreement and Pearson correlations between observers on each of the 10 observed care related activities (bed mobility, transfer, mobility, upper extremity bathing, lower extremity bathing and dressing, hygiene, use of personal assistive devices, exercise and communication) as well as the total score for the RCBC.

Using Rasch analysis, person separation and person separation reliability were calculate as they indicate how well the items of the instrument separate or spread out the subjects in the sample (Smith & Smith, 2004). High person separation reliability means that there is a high probability that persons estimated with high measures actually do have higher measures than persons estimated with low measures. This value is analogous to the KR-20 or Cronbach alpha.

Validity Testing

The internal structure, or construct validity, of the RCBC was evaluated based on Rasch Analysis (Bezruczko, 2005; Smith & Smith, 2004; Waugh RF & Chapman ES,

2005). Two values are used throughout the analysis: logit measures and fit statistics. Logits, or log-odd units, convert ordinal raw scores into linear interval measures. The logit is the natural logarithm of the odds of a person being successful at a specific task or an item being successfully carried out. The logit measures indicate whether one item is more difficult than another (e.g., is providing restorative care during bathing the upper extremity more difficulty than providing restorative care during a transfer).

To establish the fit of each of the items the INFIT and OUTFIT statistics, which are reported as mean square (MnSq) fit statistics, were considered. The mean square fit statistic value is the ratio of observed variance (variance attributable to the data) to expected variance (variance estimated by the Rasch measurement model). The INFIT and OUTFIT MnSq statistics are considered acceptable if in a range from 0.6 to 1.4 (Smith & Smith, 2004). Ideally, the ratio will be 1.0, so that observed variance equals expected variance. When the MnSq fit statistics value is greater than 1.0, for example, 1.7, there is 70% more variation in the observed data than the Rasch model predicted. When the fit statistics value is less than 1.0, there is less variation in the observed data than the Rasch model predicted.

An INFIT and OUTFIT value of less than .6 indicates that the item does not provide additional information beyond the rest of the items on the scale. An INFIT and OUTFIT value of greater than 1.4 indicates that the item does not define the same construct as the rest of the items in the instrument, is poorly constructed or misunderstood, or is ambiguously defined (Bezruczko, 2005). OUTFIT statistics are unweighted, being affected more by unexpected responses far from the item or person (e.g., a person of low ability unexpectedly getting a correct score on a difficult item).

INFIT statistics are weighted, and are affected more by unexpected responses close to the person or item (e.g., a person of low capacity unexpectedly getting an easy item incorrect).

To further test the measure for unidimensionality, a Principal Components Analysis (PCA) based on residuals was conducted. The PCA transforms correlated items into principal components. When the first principal component has an eigenvalue of less than 1.4, then the measure is considered unidimensional (Smith & Smith, 2004; Waugh & Chapman, 2005).

Convergent validity was tested by considering the self-efficacy based model shown in Figure 1 using the AMOS statistical program. For model testing the sample covariance matrix was used as input and a maximum likelihood solution sought. The Chi-square statistic, the normed fit index (NFI), and Steigers Root Mean Square Error of Approximation (RMSEA) were used to estimate model fit (Bollen, 1989; Loehlin, 1998). A $p \leq .05$ level of significance was used for all analyses.

Results

As shown in Table 2, the participants had high self-efficacy (mean=8.06, SD=1.5, range 1 to 10) and outcome expectations (mean=4.12, SD=0.70, range 1 to 5). Knowledge of restorative was low with an average score on the 15 item test of 55% (SD= 15%). Overall they had fairly positive job attitudes with a mean of 32.91 (SD=6.17) out of a high total score of 50. Thirty-six percent of these individuals (N=142) had prior restorative care nursing education. The NAs performed on average 3.4 (SD=2.0) restorative care activities when observed and did not perform restorative during 1.9

(SD=1.6) of the observed activities. Overall they performed restorative care during 63% of the observed activities (evidence of restorative care behavior/all observed behavior).

The observed restorative care activities are described in Table 3. Exercise, eating and use of personal assistive devices (e.g. hearing aids, glasses) were the three restorative care activities that were least likely to be observed. Specifically these activities were not observed over 80% of the time. This may in part be due to the difficulty of capturing these activities, or it may be due to the limited amount of time residents engaged in these activities (i.e. exercise). Of the behaviors observed, restorative care was most likely to be provided for communication, transfers, bed mobility, and upper extremity bathing and dressing.

Validity Testing

The results of the Rasch analysis are shown in Table 4. These items all fit the model. Communication had a high OUTFIT statistic. The INFIT statistic for communication, which is more relevant than the OUTFIT statistic as it is sensitive to unexpected behavior affecting responses to items near the person's proficiency level, was within an acceptable range. Therefore, this item was considered a good fit to the model. A principal components analysis based on residuals indicated that there were no additional dominant factors to the measure. Mapping of the 10 items suggested that mobility was the most unlikely area in which to see NAs engage in restorative care activities, the next most unlikely was use of devices, lower extremity bathing, hygiene, upper extremity bathing, eating, bed mobility, transfers, and lastly communication and exercise were the two most common activities in which NAs perform restorative care activities.

Results of model testing to evaluate the factors that influenced NA performance of restorative care (Figure 1) showed that only 8 of the 58 hypothesized paths were statistically significant. Retesting of the model with significant paths only noted that gender was the only path to directly or indirectly influence restorative care activities (Lambda = .10, p=0.02). Females were more likely to engage in restorative care activities than males. Age (Lambda=-0.12, p=.02) and gender (Lambda=-0.12, p=.02) significantly influenced knowledge of restorative care such that those who were older and female tended to have lower scores on the paper and pencil test of restorative care knowledge. This accounted for 3% of the variance in knowledge of restorative care. Knowledge of restorative care (Lambda = .24, p=.01) and self-efficacy expectations (Lamda = .17, p=.01) influenced outcome expectations for restorative care and accounted for 9% of outcome expectations. Those with greater knowledge and stronger self-efficacy expectations for restorative care activities were more likely to have stronger outcome expectations for restorative care. Years of education (Lambda=0.12, p=0.01), age (Lamda=0.14, p=0.01), and self-efficacy expectations (Lambda=0.16, p=0.01) influenced job attitude and accounted for 6% of the variance in job attitude. Those who were older, more educated, and had stronger self-efficacy expectations were more satisfied with the job.

The data showed a good fit to the hypothesized model. The chi-square was non-significant (p=0.56), and the chi-square divided by degrees of freedom ratio was 0.92, the NFI was 0.95 and the RMSEA was 0.01. The model, however, only explained a small percentage (4%) of the variance in restorative care behaviors.

Reliability Testing

The person separation based on Rasch analysis was 6.63 and the person reliability was 0.77. Percent agreement between two raters ranged from 70% to 100% on the individual items, with only 3 items scoring below 80% agreement. Agreement on all 10 behaviors ranged from 83% to 100%. Pearson's correlation coefficients ranged from 0.72 for the Communication subscale to 1.00 for four subscales including Hygiene, Eating, Personal Assistive Devices, and Exercise.

Discussion

The findings from this study provide some preliminary support for evidence of reliability and validity of the RCBC. The inter-rater reliability of this measure was good. By using the written guidelines to provide examples of restorative care interactions and checklist scoring, there was minimal discrepancy about whether or not the NAs performed restorative care when engaged in a care activity with a resident. Although there was sufficient support for the internal consistency of the measure (person separation of 0.77) this is relatively low. This is in part due to the fact that the RCBC covers a wide range of restorative care behaviors.

There was some evidence to support the validity of the measure based on Rasch analysis with a good fit of the items supporting the unidimensional nature of the measure. Communication had a high OUTFIT statistic which is not surprising given that communication was one of the easier items to endorse. The majority of the NAs communicated with residents using a restorative care approach. An example of communication behavior that was consistent with restorative care included encouraging the individual to communicate on his or her own. Further testing of this measure only

among resident with moderate to severe cognitive impairment, or those with aphasia, should be done prior to removing this item from the measure.

This study did not provide evidence for the concurrent validity of the RCBC. The theoretically based model suggesting that self-efficacy and outcome expectations would influence restorative care behaviors was not supported in model testing. Prior research related to self-efficacy and job performance has supported the hypothesized direct relationship between self-efficacy and outcome expectations and job performance(Bono & Judge, 2003; Judge & Bono, 2001), although these relationships have not been consistent. For example, the mediating effects of self-efficacy and outcome expectations on sales performance was only partially supported in a study testing self-management training to improve job performance among sales people(Frayne & Geringer, 2004). Similarly, self-efficacy expectations related to preventing assaults by residents was not related to actual assaults experienced (Gates, Fitzwater, Telintelo, Succop, & Sommers, 2004).

Performing restorative care activities by NAs is complex and may be explained more comprehensively using a social ecological model approach. The social ecological model suggests that an individual's behavior is affected by a wide sphere of influences: intrapersonal, interpersonal, institutional/organizational, and public policy. Social ecological models provide an overarching framework or set of theoretical principles for understanding the interrelations among diverse personal and environmental factors in human health and illness. There is increasing recognition that this type of multilevel perspective is needed to address complex behaviors. Macro-level conditions such as policy and environment have an influence at the institutional/organizational level and the

interpersonal and intrapersonal factors as well. Given the small amount of variance (4%) explained by the theory of self-efficacy alone, it is likely that this more comprehensive model of behavior is needed to fully understand the restorative care behavior of NAs. Other factors that may influence restorative care and are suggested by the social ecological model approach include the social skills of the NAs and their ability to work with others to accomplish tasks, organizational issues such as staffing, and the characteristics of the resident (e.g. motivation or cognitive status).

Study Limitations

This study was limited in that it included observations of a select group of NAs who were willing to participate in a restorative care study. It was further limited by the short observation period considered during each of the evaluations. We intend in future work to extend the period of evaluation and/or to repeat observations at different periods of time throughout the day in order to observe more care behaviors.

Despite these limitations the study provided some support for the reliability and validity of the RCBC. Strengths of this instrument include a well defined coding scheme and simple scoring procedures that control for observer drift and improve the reliability of the measure. The development and psychometric testing of the RCBC is an important first step in the observational assessment of a restorative care activities performed by NAs, or other caregivers of older adults living in long term care settings. The availability of a tool such as the RCBC will provide researchers with objective data, not reliant on reporting bias, to better evaluate the impact of interventions designed to increase the restorative care behaviors of NAs and thereby optimize function and physical activity among residents in long term care facilities.

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Table

Table 1 Demographic Information on the Nursing Assistants (N=386)

Variable	N (%)	Mean (Standard Deviation)
Gender		
Male	28(7)	
Female	358(93)	
Race		
Caucasian	22(6)	
Black	342(88)	
Other	22(6)	
Prior Restorative Care Training		
Yes	138(36)	
No	244(63)	
Missing	4(1)	
Education		
High School		
Less than High School		
More than High School		
Age		40.9 (11.9)
Years of Education		14.7(3.9)
Years of Experience as an NA		10.8(8.7)
Years of Experience in the Facility		5.5 (4.9)

Table

Table 2: Descriptive Statistics of Restorative Care Study Outcomes (N=386 Nursing Assistants)

Variable	Range		Descriptive	
	Minimum	Maximum	Mean	SD
Job Attitude	18.00	50.0	32.9	6.2
Outcome expectations	1.00	5.0	4.1	.70
Self-efficacy expectations	1.30	10.0	8.1	1.5
Knowledge of Restorative Care	.13	.93	.55	.15
Number of Restorative Care Activities Performed	.00	9.0	3.4	2.0
Number of Restorative Care Activities Not Performed	.00	7.0	1.9	1.7
Years experience as an NA in any facility	1.0	46.0	11.6	8.5
Number of Restorative Care Activities Performed	0	9	3.4	2.0
Number of Restorative Care Activities Not Performed	0	7	1.9	1.6

Table

Table 3 Description of Restorative Care Activities

Activity	Not Applicable*	Performed	Not Performed	Missing
Bed Mobility	103(26%)	185 (47%)	99(25%)	8(2%)
Transfer	117 (30%)	207 (52%)	63(16%)	8(2%)
Mobility	196(50%)	80(20%)	111(28%)	8(2%)
Upper extremity bathing and dressing	73(19%)	190(48%)	124(31%)	8(2%)
Lower extremity bathing and dressing	56(14%)	140(35%)	191(48%)	8(2%)
Hygiene	228(58%)	99(25%)	60(15%)	8(2%)
Eating	345(87%)	26(7%)	16(4%)	8(2%)
Use of assistive devices	319(81%)	34(9%)	34(9%)	8(2%)
Exercise Programs	368 (93%)	18(5%)	-	9(2%)
Communication	-	347(88%)	39(10%)	9(2%)

*The care related activity did not occur during the observation period

Table

Table 4 Fit Statistics for Items on the RCBC

Item	10 Item Model INFIT (ZStd)	10 Item Model OUTFIT (ZStd)
Communication	1.14(.90)	9.90(4.9)
Bed mobility	1.14 (1.3)	1.3(1.6)
Devices	1.16(1.2)	1.04(0.3)
Mobility	1.08(.90)	1.12(0.50)
Exercise	0.98(-.30)	1.10(0.80)
Hygiene	0.95((-.40)	0.86(-.60)
Transfer	0.89(-.90)	0,84(-.60)
Eating	0.86(-.60)	0.61(-1.0)
Upper extremity bathing	0.83(-2.0)	0.67(-2.3)
Lower extremity bathing	0.80(-2.8)	0.59(-1.7)

Figure

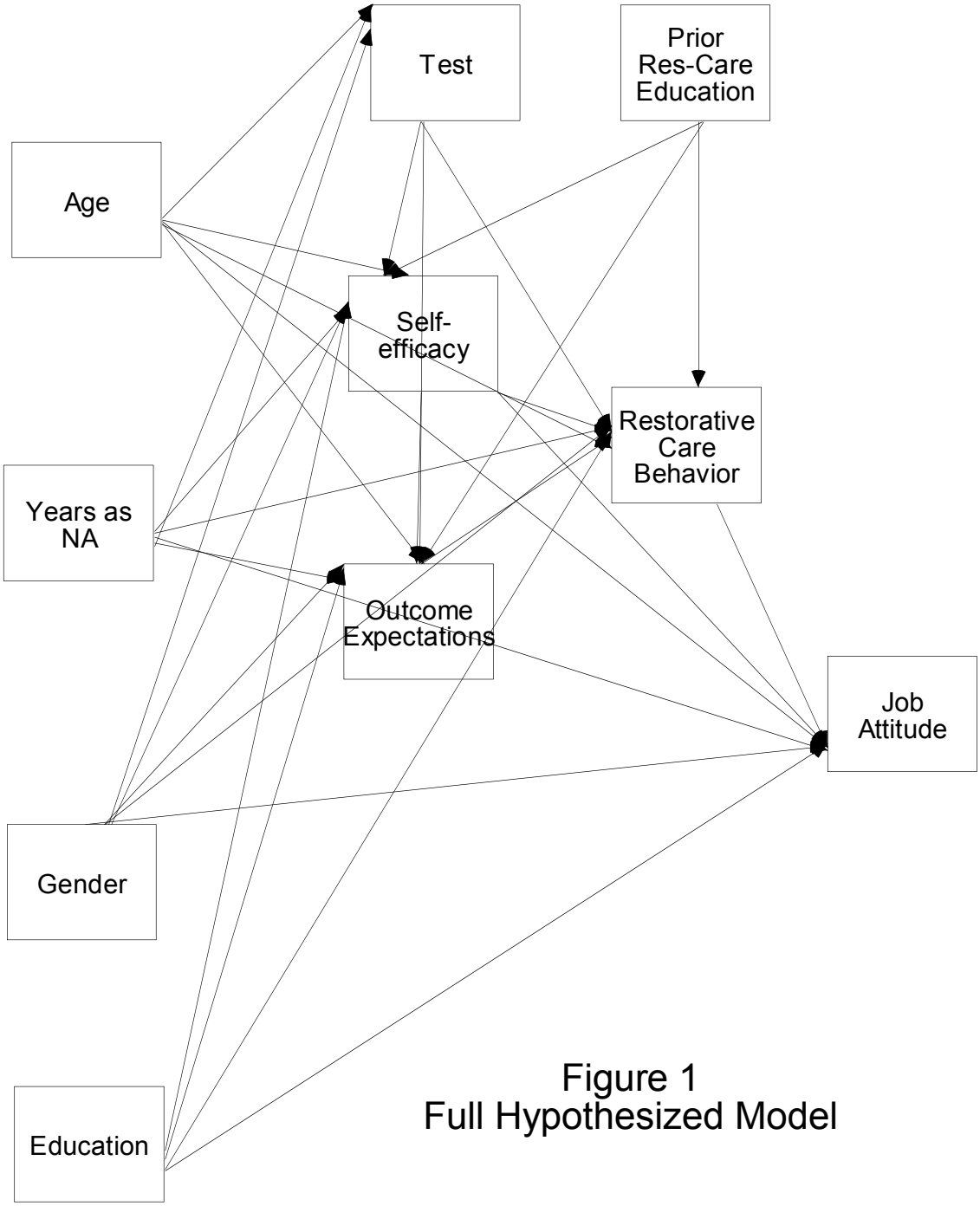

Figure 1
Full Hypothesized Model