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Brief Report

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Caregiver Person-Centeredness and Behavioral Symptoms in Nursing Home Residents with Dementia: A Timed-Event Sequential Analysis

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Purpose: Evidence suggests that person-centered caregiving approaches may reduce dementia-related behavioral symptoms; however, little is known about the sequential and temporal associations between specific caregiver actions and behavioral symptoms. The aim of this study was to identify sequential associations between caregiver person-centered actions, task-centered actions, and resident behavioral symptoms and the temporal variation within these associations.

Design and Methods: Videorecorded observations of naturally occurring interactions ($N = 33$; 724 min) between 12 nursing home (NH) residents with dementia and eight certified nursing assistants were coded for caregiver person-centered actions, task-centered actions, and resident behavioral symptoms and analyzed using timed-event sequential analysis.

Results: Although caregiver actions were predominantly person-centered, we found that resident behavioral symptoms were significantly more likely to occur following task-centered caregiver actions than person-centered actions.

Implications: Findings suggest that the person-centeredness of caregivers is sequentially and temporally related to behavioral symptoms in individuals with dementia. Additional research examining the temporal structure of these relationships may offer valuable insights into the utility of caregiver person-centeredness as a low-cost strategy for improving behavioral symptom management in the NH setting.

Key words: Person-centered interaction, Caregiver task-centeredness, Mealtime interactions

Dementia-related behavioral symptoms, such as motor agitation and care resistance, are experienced by virtually all people with dementia at some point in their disease trajectory and are recognized as a source of considerable distress for people with dementia and their caregivers (Gitlin, Kales, & Lyketsos, 2012). In addition to being very common in nursing home (NH) residents, behavioral symptoms are challenging to manage and contribute to

high levels of caregiver burden; worsening high turnover rates among NH staff (Norton, Allen, Snow, Hardin, & Burgio, 2010).

Improving the management of behavioral symptoms among NH residents with dementia has been identified as a priority by clinicians, researchers, and end-users of NH services (Morley et al., 2014). Nonpharmacologic treatments are considered first-line therapy for behavioral symptom management (Gitlin et al., 2012). Delivery of person-centered care, which involves individualized, resident-directed care focused on person rather than task, has been identified as one such approach (Edvardsson, Winblad, & Sandman, 2008) and has been shown to improve behavioral outcomes in some instances (Chenoweth et al., 2009; Fossey et al., 2006; Sloane et al., 2004). However, the exact mechanisms by which person-centered care approaches ultimately modify or influence the presentation of behavioral symptoms is not well understood.

Previous research has demonstrated that specific behavioral symptoms are sequentially related to some types of caregiver behaviors including infantilizing speech and negative statements (Roth, Stevens, Burgio, & Burgio, 2002; Williams, Herman, Gajewski, & Wilson, 2009). These types of interactions are often characterized as "task-centered," wherein caregiving is dominated by routines and completion of tasks. And caregiver actions may undermine a resident's preferences, goals, or status. However, no study has examined sequential associations between person-centered and task-centered caregiver interactions and various behavioral symptoms. Furthermore, variations in the temporal features of sequential associations between caregiver person-centeredness and behavioral symptoms have not been examined. Knowledge of these relationships can inform a broader evidence base for the practice of person-centered care approaches, as caregiver person-centeredness may have both an immediate, as well as cumulative effect on the presentation of behavioral symptoms. Furthermore, identifying the timeframe within which more immediate effects of person-centered interaction are realized is of particular relevance to people with dementia, whose daily experiences are often lived moment-to-moment.

This study used video observations of caregiver–resident mealtime interactions to identify sequential associations between caregiver person-centered actions, caregiver task-centered actions, and resident behavioral symptoms and the temporal variation within these associations in NHs engaged in person-centered dementia caregiving. A second aim was to explore possible antecedent–consequence relationships between specific task-centered actions and behavioral symptoms. The overall hypothesis was that caregiver task-centered actions would be associated with higher likelihood of behavioral symptoms than person-centered actions.

Methods

Participants and Setting

Participants included residents with dementia and staff from memory care units (MCU) in two NHs in Wisconsin. Participating NHs were purposively selected for their organizational focus on person-centered caregiving and the use of consistent staffing practices in their MCUs.

Eligibility criteria for NH residents included: (a) identified by staff as having a documented diagnosis of dementia, (b) identified by staff as requiring moderate to significant mealtime assistance, and (c) a legal guardian providing informed consent. Eligibility criteria for NH staff were that they (a) be a certified nursing assistant (CNA) working primarily on the MCU and (b) provided informed consent and agreed to provide mealtime care to participating residents during observations. The caregiving situation of mealtimes was chosen to provide some control over other factors that may influence interactions, such as general proximity between caregivers and residents and noise level. In both settings, the mealtime situation took place in dining rooms where residents were seated individually or at group tables in consistent locations. Observations took place when the resident was seated at the table and continued throughout the duration of the meal or until the resident left the table.

Written informed consent was obtained from legal guardians of eligible resident participants. After obtaining consent from the guardian, research staff attempted to obtain assent from resident participants prior to each observation. No resident participants dissented. Written informed consent was also obtained from CNA participants for collection of demographic information and participation in video observations. Institutional Review Board Approval was obtained from the University of Wisconsin–Madison.

Procedure and Measures

Video observations of caregiver–resident interactions were collected between January and February 2014. Research staff attempted to observe each resident for three mealtimes, which was not always feasible due to resident unavailability (e.g., illness, meal refusal), resulting in a range of observational sessions being conducted per resident (average 2, range 1–5). Some meals were interrupted due to other care needs, in these instances each "meal attempt" was coded as a unique observation resulting in some residents contributing more than three observations.

Video observations were recorded using GoPro HERO3 cameras, which are approximately 2 by 1 inch in size. Cameras were placed prior to residents being seated at the table and all residents were observed in their routine dining location.

Measures

A computer-assisted coding scheme was developed by the research team to measure caregiver person-centered actions, task-centered actions, and resident behavioral symptoms that integrated items from several validated observational measures (Coleman, Medvene, & Van Haitsma, 2013; Lann-Wolcott, Medvene, & Williams, 2011; Rosen et al., 1995). The coding scheme was executed using the Noldus Observer® XT by four trained observers and demonstrated good to very good observer agreement (Cohen's k = 0.80–0.85, percent agreement 86%–90%).

Caregiver Person-Centeredness

Caregiver person-centered actions and task-centered actions were measured using the Person-Centered Behavior Inventory (PCBI) and Task-Centered Behavior Inventory (TCBI) which have demonstrated interrater reliabilities averaging 0.82 (Coleman et al., 2013; Lann-Wolcott et al., 2011). The PCBI includes 11 verbal categories (e.g., "giving choices" which may involve seeking the resident's point of view, permission, or perspective) and eight nonverbal categories (e.g., resident-directed eye gaze). The TCBI includes two verbal categories (verbally/interrupting statements) and three nonverbal categories (ignoring, physically controlling, inappropriate touch). Two task-centered actions that were observed in pilot testing but not accounted for in the TCBI were added to the coding scheme: controlling voice quality and outpacing the resident.

Behavioral Symptoms

Behavioral symptoms were measured using the Pittsburgh Agitation scale (PAS) which includes four behavioral domains: aberrant vocalization, motor agitation, aggressiveness, and resisting care (Rosen et al., 1995). The PAS has demonstrated interrater reliabilities averaging 0.92 in NHs. To enhance accuracy and reliability, we modified the intensity ratings for motor agitation and aberrant vocalization from a range of 0–4 to a range of 1–2 to denote low/minimal intensity levels and moderate/high intensity levels. As this study did not document absence of symptoms, the 0 intensity rating was not used.

Analysis

We selected the observation, rather than the resident or dyad, as the unit of analysis for this study as individual residents contributed varying amounts of information and dyads were not independent of one another. All analyses were computed using General Sequential Querier Version 5.1.

We computed descriptive statistics to describe the relative frequencies and durations of caregiver actions and behavioral symptoms across observations. A lag-based sequential analysis was designed a priori to examine specific sequential associations between caregiver person-centered actions, task-centered actions, and behavioral symptoms. Person-centered and task-centered actions were examined as antecedents to behavioral symptoms over a range of lag intervals ranging from 10 to 60 s between antecedent and consequence events (behavioral symptoms). Conditional probabilities were computed to indicate the likelihood of a consequence event occurring provided the antecedent event took place within the lag interval. Confidence intervals associated with odds ratios (ORs) were used as an estimate for the significance of sequential association and Yule's Q, which varies from −1 to +1 with zero indicating no effect, to provide an estimate of effect size as ORs are likely to have skewed distributions and are sensitive to zero cell counts (McComas et al., 2009).

A second aim was to explore possible antecedent–consequence relationships between specific task-centered actions and behavioral symptoms. Lag-based sequential analysis was performed across all individual task-centered caregiver actions and behavioral symptoms using the lag interval that demonstrated the strongest association in primary a priori analysis and conditional probabilities were computed.

Results

A total of 33 video observations (average duration 24.5 min) which included 12 NH residents and eight CNAs were collected (Table 1).

Person-Centered and Task-Centered Caregiver Actions as Antecedents to Behavioral Symptoms

Ninety-six percent of caregiver actions were person-centered (Table 2), accounting for 88% of the duration of all caregiver actions. The mean number of behavioral symptoms during an observation was 2.6, ranging from 0 to 26. Behavioral symptoms were present in 13 observational sessions and exhibited by nine residents (Table 3).

As shown in Table 4, behavioral symptoms were significantly more likely to occur following a task-centered

Table 1. Description of Participants

Residents	
Mean age in years (range)	84 (71–98)
Sex, *n* (%)	
Men	6 (50)
Women	6 (50)
Caregivers	
Mean age in years (range)	42 (31–52)
Sex, *n* (%)	
Men	0 (0)
Women	8 (100)
Race/ethnicity	
Caucasian	4 (50)
African American	3 (37)
Hispanic	1 (13)
Dementia care experience in years (range)	16 (10–23)

Table 2. Relative Frequency and Relative Duration of Caregiver Person-Centered Actions and Task-Centered Actions

Person-centered actions	Relative frequency	Relative duration (s)
Adjusting to resident's pace	0.07	0.18
Affirmative nodding	0.01	0.02
Appropriate use of affectionate touch	0.03	0.15
Asking resident for help	0.04	0.02
Assessing comfort (nonverbal)	0.09	0.04
Assessing comfort or condition (verbal)	0.04	0.02
Back-channel responses	0.11	0.05
Empathy	0.01	0.00
Giving choices	0.08	0.04
Greetings	0.02	0.01
Orientation	0.28	0.13
Positive gestures	0.03	0.11
Proximity	0.01	0.09
Resident-directed eye gaze	0.02	0.07
Showing interest	0.11	0.05
Showing approval	0.05	0.03
Positive voice quality	0.00	0.01
Task-centered actions	**Relative frequency**	**Relative duration (s)**
Controlling voice quality	0.05	0.08
Ignoring	0.16	0.29
Inappropriate touch	0.16	0.11
Outpacing	0.40	0.43
Physically controlling	0.16	0.09
Verbally controlling	0.07	0.02

Table 3. Relative Frequency and Relative Duration of Resident Behavioral Symptoms

Behavioral domain	Relative frequency	Relative duration (s)
Aggression		
Verbal threats	—	—
Threatening gestures	0.01	0.00
Physical toward property	—	—
Physical toward self or others	—	—
Motor agitation		
Minimal motor agitation	0.07	0.15
Intense rapid motor agitation	0.01	0.02
Aberrant vocalizations		
Minimally disruptive aberrant vocalizations	0.36	0.30
Loud, disruptive aberrant vocalizations	—	—
Resisting care		
Pushing away/physical refusal of care	0.13	0.08
Procrastination or avoidance	0.03	0.32
Verbal or gesture of refusal of care	0.39	0.13
Striking out at caregiver	—	—

Note: A dash indicates that this behavioral symptom did not occur.

caregiver action than a person-centered caregiver action across a range of lag intervals. The effect of this association was strongest at a lag interval of 45–60 s, where the likelihood of a behavioral symptom following a task-centered action ranges from 19% to 21% (Yule's Q = 0.89–0.90; OR = 17.38–18.53) as compared with 2% likelihood following a person-centered action (Yule's Q = 0.18–0.21; OR = 1.43–1.52). The general range of sequential association between person-centered actions and behavioral symptoms was consistent across lag intervals.

Patterns of Transitions Between Caregiver Task-Centered Actions and Behavioral Symptoms

Ten unique patterns of transition events between specific caregiver task-centered actions and unique behavioral symptoms out of 42 possible transitions were identified. The transition patterns demonstrating the highest conditional probabilities were for controlling voice quality precipitating minimally disruptive aberrant vocalizations (75% likelihood), verbally controlling actions precipitating pushing away/physical refusal of care (38% likelihood), and ignoring precipitating minimally disruptive aberrant vocalizations (27% likelihood).

Table 4. Lag-Sequential Analysis for Caregiver Person-Centered Actions and Task-Centered Actions as Antecedents of Behavioral Symptoms

Antecedent	Conditional probability	Yule's *Q*	Odds ratio
Lag interval—10 s			
Caregiver task-centered action	.13	0.81	9.68 (7.25–12.90)
Caregiver person-centered action	.02	0.07	1.16 (0.90–1.50)
Lag interval—15 s			
Caregiver task-centered action	.14	0.83	10.68 (8.06–14.14)
Caregiver person-centered action	.02	0.15	1.34 (1.05–1.71)
Lag interval—20 s			
Caregiver task-centered action	.15	0.84	11.31 (8.57–14.93)
Caregiver person-centered action	.02	0.05	1.11 (0.85–1.45)
Lag interval—25 s			
Caregiver task-centered action	.15	0.85	11.95 (9.08–15.72)
Caregiver person-centered action	.02	0.04	1.09 (0.83–1.42)
Lag interval—30 s			
Caregiver task-centered action	.18	0.88	15.27 (11.80–19.75)
Caregiver person-centered action	.02	0.12	1.26 (0.98–1.63)
Lag interval—35 s			
Caregiver task-centered action	.18	0.87	14.93 (11.51–19.36)
Caregiver person-centered action	.02	0.11	1.24 (0.96–1.60)
Lag interval—40 s			
Caregiver task-centered action	.19	0.88	15.98 (12.36–20.66)
Caregiver person-centered action	.02	0.13	1.30 (1.01–1.67)
Lag interval—45 s			
Caregiver task-centered action	.20	0.89	17.38 (13.50–22.38)
Caregiver person-centered action	.02	0.21	1.52 (1.20–1.94)
Lag interval—50 s			
Caregiver task-centered action	.19	0.88	16.26 (12.55–21.05)
Caregiver person-centered action	.02	0.19	1.48 (1.16–1.89)
Lag interval—55 s			
Caregiver task-centered action	.21	0.90	18.53 (14.41–23.82)
Caregiver person-centered action	.02	0.19	1.47 (1.14–1.88)
Lag interval—60 s			
Caregiver task-centered action	.20	0.90	18.15 (14.09–23.39)
Caregiver person-centered action	.02	0.18	1.43 (1.11–1.84)

Discussion

This is the first study to identify sequential associations between caregiver person-centeredness and resident behavioral symptoms. Our findings suggest that certain task-centered actions may serve as antecedents to behavioral symptoms in settings where high levels of person-centered caregiving occur. This study provides additional evidence, albeit preliminary, that the behaviors of caregivers are sequentially and temporally related to behavioral symptomatology in individuals with dementia.

The hypothesis that behavioral symptoms are more likely to occur following task-centered actions was supported across all timeframes but demonstrated that strongest association 45–60 s between antecedent and consequence events. This finding may suggest that the more immediate influence of caregiver actions on behavioral symptomology is somewhat delayed or may reflect a prolonged or escalating behavioral responses to caregiver actions. Some of this delay may also be accounted for by variations in the onset and offset of different caregiver events or resident delays in processing and responding to stimuli.

Although this study was not adequately powered to examine the significance of specific transition patterns, it provides a preliminary assessment of the range of transition patterns between caregiver task-centeredness and behavioral symptoms, suggesting that an increased likelihood of certain behavioral symptoms may be primarily accounted for by distinct task-centered behaviors. More rigorous examination of similar patterns may help identify which behavioral symptoms are highly responsive to certain caregiving actions which may inform the development of tailored, symptom-based approaches to person-centered caregiving interventions.

The small sample size was a limitation. Also, the environment is quite unusual in the preponderance of

person-centered caregiving practices. As volunteers, participating caregivers may differ from caregivers who chose not to participate. Additional research examining these relationships with larger and more diverse resident and caregiver populations and settings—such as nonmemory care units, is warranted. Finally, data were analyzed at the level of the observation in this study. Future studies with independent, consistent dyads in which dyadic and individual variation in responsiveness to caregiver task-centered and person-centered behaviors can be explored are needed. Although these limitations affect the generalizability of the findings in this particular study, the descriptive findings of this study also provide unique insight into caregiver–resident interaction care processes in the context of innovation in person-centered caregiving.

In summary, there is tremendous attention focused on reducing behavioral symptoms among NH residents. Findings from this study suggest that the person-centeredness of caregivers is sequentially and temporally related to behavioral symptoms in individuals with dementia. Additional research examining the temporal structure of these relationships may offer valuable insights into the utility of caregiver person-centeredness as a low-cost strategy for improving behavioral symptom management in the NH setting.

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