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Associations between the working characteristics of nursing staff and the prevalence of behavioral symptoms in people with dementia in residential care

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ABSTRACT

Background: Clinical experience suggests that the work characteristics of staff in residential care may influence the well-being of residents with dementia. However, few studies have explored those anecdotal experiences. The aim of this study was to investigate associations between work characteristics of nursing staff and prevalence of behavioral symptoms among people with dementia in residential care settings.

Methods: The self-report job strain assessment scale was used to measure staff perceptions of their working environment, and the Multi Dimensional Dementia Assessment Scale to measure the occurrence of behavioral symptoms among residents in 40 residential care units for people with dementia.

Results: The findings show that in settings where staff reported high job strain, the prevalence of behavioral symptoms was significantly higher compared to settings where staff reported low job strain. Furthermore, settings characterized by staff having a more positive caring climate had significantly less prevalence of escape, restless and wandering behaviors compared to settings having a less positive caring climate. There was no statistically significant association between staff members' self-reported knowledge in caring for people with dementia and prevalence of behavioral symptoms.

Conclusions: This study provides evidence for the oft-cited clinical experience that the well-being of nursing staff is associated with the well-being of people with dementia in residential care settings.

Key words: dementia, behavioral symptoms, job satisfaction

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Introduction

The occurrence of behavioral and psychological symptoms in dementia (BPSD) is a frequent and distressing complication related to dementia. Behavioral symptoms have been described as expressions of changed perceptions of reality with disrupted mood and distorted behavior manifested through expressions of anxiety, hallucinations and delusions, aggression and agitation, wandering, restlessness, rummaging and other socially and/or sexually deviant behaviors (Finkel *et al.*, 1996). The etiology of BPSD entails biological, social and psychological factors (Purundare *et al.*, 2000) and up to 90% of people with dementia exhibit behavioral symptoms at some point during the progression of the disease (Grossberg and Desai, 2003).

The literature on behavioral symptoms in dementia (and hence also the general view of these symptoms) can be divided into two main models: the first represents a biomedical model of behavior as a disturbing symptom of anatomical and neuro-chemical damage to the brain (e.g. Miller *et al.*, 1997); the second corresponds to an interactive/communicative model of behavior as meaningful communication emerging from interactions with the environment (Lawton, 1986; Graneheim, 2005). The widely used ecological theory of aging (Lawton, 1986) suggests that all behavior is a product of demands of the environment and levels of personal competence to meet these demands. If environmental demands exceed personal competence (for example, in Alzheimer's disease), misinterpretations will occur and behavior will consequently seem inappropriate. From this perspective, identifying and adjusting potential trigger factors in the environment can complement and/or replace the frequent use of pharmacological strategies in treating BPSD (cf. Desai and Grossberg, 2001; Sandman *et al.*, 2006).

There is also growing evidence suggesting that factors other than patients' characteristics contribute to explain the variance of behavioral symptoms, prevalence of physical restraints and use of psychotropic medication (Karlsson *et al.* 2001; Norberg *et al.* 2002; Lövheim *et al.* 2006; Pekkarinen *et al.* 2006). What these studies indicate is that, in addition to patients' characteristics, variables such as the physical and psychosocial care environment, characteristics of the nursing work and of nursing staff have been shown to influence the well-being of people with dementia.

When studying how the psychosocial work environment influences health outcomes, the job strain model (Karasek and Theorell, 1990) is one of the most widely used. The model states that people working under high job strain (high work demands with low control and support) have a higher risk of health problems than those with low or no such strain. Previous evidence suggests that high job strain is associated with increased risks, for example of coronary heart disease and cardiovascular mortality (Kivimäki *et al.*, 2002; Kuper and Marmot, 2003). This model postulates that combinations of high psychological demand, low control and low social support at work results in job strain. Psychological demand refers to experiences of work load in terms of pace, intensity, and the skills demanded to be able to do the work; control refers to experiences of control over one's work situation in terms of creativity, repetitiveness, and freedom to

decide what to do and when to do it; and social support refers to the extent to which the workplace in general is perceived as supportive, understanding and friendly (Karasek and Theorell, 1990).

Clinical experience suggests that the well-being of staff has an influence on the well-being of people with dementia in residential care settings. However, few studies have explored whether the working characteristics of nursing staff are associated with outcomes among people with dementia in such settings. The aim of this study was to investigate associations between the work characteristics of nursing staff and the prevalence of behavioral symptoms among people with dementia in residential care settings in the north of Sweden.

This investigation is therefore based on the following hypotheses:

1. Units in which nursing staff rate their job strain as being higher would have a higher prevalence of behavioral symptoms among residents compared to units in which staff rated their job strain as lower.
2. Units in which nursing staff rated the caring climate as less positive would have a higher prevalence of behavioral symptoms among residents as compared to units where staff rated the caring climate as more positive.
3. Units in which nursing staff rated their knowledge in caring for people with dementia as lower would have a higher prevalence of behavioral symptoms among residents compared to units in which staff rated their knowledge in caring for people with dementia as higher.

Methods

This study uses data from a larger intervention project which studied the effects of an educational program for nursing staff within community residential care settings in nine municipalities in northern Sweden. A total of 40 residential care units for people with dementia participated in the intervention study, providing cross-sectional baseline data on staff self-reported job strain, caring climate, knowledge in caring for people with dementia, opportunities to have discussions about ethical conflicts and challenges at work, and measures of prevalence of behavioral symptoms among the residents. These data were extracted and analyzed to explore associations between the working situation of staff and the prevalence of behavioral symptoms among residents.

Measures for data collection

Two assessment scales were used in this study; the self-report job strain assessment scale (Karasek and Theorell, 1990) to measure staff perceptions of their working environment, and the Multi Dimensional Dementia Assessment Scale (Sandman *et al.*, 1988) to measure the occurrence of behavioral symptoms, activities of daily living (ADL) function, and ability to walk and communicate among residents.

Job strain assessment scale

The job strain assessment scale consists of job demands, job control and social support. *Job demands* comprised five items, such as "My job requires working very fast." Responses were given on a four-point Likert scale ranging from 4 = "yes, often" to 1 = "no, almost never." The job demands index was the sum of the response scores. *Job control* comprised six items, such as "My job requires a high level of skill," and "My job requires that I learn new things." Responses were given on the same four-point Likert scale The job control index was the sum of the response scores. *Social support* comprised six items, such as "My work mates are there for me," and "I get along well with my work mates." Responses were given along a four-point Likert scale ranging from 4 = "totally agree" to 1 = "totally disagree." The social support index was the sum of response scores divided by six.

The Multi Dimensional Dementia Assessment Scale (MDDAS)

The MDDAS measures behavioral and psychiatric symptoms, motor functions, speech, hearing, visual ability, orientation and ADL-functions among residents with dementia, and the physical and psychological workload of staff. The original scale consists of 25 items measuring behavioral symptoms; however, only 19 of these were used since factor analyses (Nasman *et al.*, 1993) have shown that 19 items can be statistically extracted to capture six groups of behavioral symptoms: escape behavior, aggression, restlessness, wandering, regression and verbally disruptive behavior. Test for intra- and inter-rater reliability has shown correlations varying between 71–95% and 56–95% respectively for the MDDAS (Nasman *et al.*, 1993). *Escape behavior* comprised three items, such as "Packs up his/her things to go home." *Aggressive behavior* comprised four items, such as "Hits patients and staff" and "Aggressive threats (word and gestures) to patients and staff." *Restless behavior* comprised four items, such as "Tears up newspapers etc." and "Rolls up tablecloths." *Wandering behavior* comprised four items, such as "Wanders back and forth alone or with other patients." *Regressive behavior* comprised two items, such as "Undresses in the day room." *Verbally disruptive behavior* also comprised two items, such as "Shrieks and shouts continuously." For all items, responses were given along a three-point scale in which 3 = every day, 1 = sometimes per week, and 0 = never. All behavioral group indexes were the sum of response scores divided by the number of items in the respective group.

Ratings of caring climate at units, together with self-perceived knowledge in caring for people with dementia, were collected using two 100 mm visual analogue scales, ranging from "Very Bad" to "Very Good" and from "Greater knowledge" to "Lesser Knowledge" respectively. A question regarding the extent to which staff had opportunities to discuss difficulties and ethical conflicts at work provided additional data.

Analysis

Job strain scores were calculated for all nursing staff in the 40 participating units using the commonly employed formula of dividing demand scores by

control scores (Santavirta *et al.*, 2007). A unit-level mean job strain score was calculated for each participating unit, and units were then ranked between 40 and 1 representing units in order from highest to lowest total job strain. The same ranking procedure was repeated for scores on caring climate and knowledge of caring for people with dementia. The prevalence of behavioral symptoms among residents in high scoring units was then systematically compared with the prevalence of behavioral symptoms among residents in low scoring units (data were separated into halves, quartiles and deciles).

In addition, staff characteristics such as sex, age, professional status, work experience, knowledge in caring for people with dementia, and ratings of caring climate in the 20 units with the highest total job strain scores were compared with the same staff characteristics in the 20 units with the lowest job strain scores. Furthermore, resident characteristics such as sex, age, ADL score, communicative and motor ability were compared in the 20 units with highest job strain versus the 20 units with lowest total job strain scores.

Statistics

In addition to descriptive statistics, the Mann-Whitney U-test was used to examine associations between ordinal scale variables, χ^2 was employed to examine differences between dichotomized variables, and the independent t-test was employed on scale variables. A p value of 0.05 or less was considered statistically significant. All data in this study were analyzed using SPSS for Windows (Version 11.0).

Ethics

The study was approved by the Ethics Committee of Umeå University, Sweden (§92/02, Dnr 02-105).

Results

The sample consisted of 40 residential care units for people with dementia selected on the basis of meeting the inclusion criteria of having at least 20% of residents subjected to physical restraints. Physical restraints were defined as technical devices inhibiting the individual's freedom of movement, including belts or geri-tables, but excluding bedrails. The participating units consisted of 6 to 14 beds, amounting to a total number of 354 beds. Data from 97% of the residents ($n = 344$) were collected by staff. The mean age of residents was 82.1 ± 7.8 years, and 245 (71.2%) were women. The response rate of self-report data of staff was 88% ($n = 346$), the mean age of staff was 42.6 ± 12.1 years, and 245 (90%) were women. Participating nursing staff comprised nurses' aids, licensed practical nurses and registered nurses. Descriptive data for the sample of nursing staff and residents are given in Table 1.

As shown in Table 1, staff in the 20 units with highest job strain scores were significantly more often women ($p = 0.046$), of younger age ($p = 0.004$), with less work experience ($p = 0.007$), who experienced the caring climate as

Table 1. Comparison between staff and resident characteristics in the 20 units with the highest job strain and the 20 units with the lowest job strain

	20 UNITS WITH HIGHEST JOB STRAIN	20 UNITS WITH LOWEST JOB STRAIN	P VALUE
Nursing staff/patient ratio (mean/SD)	0.8/0.2	0.8/0.2	0.190
Staff (n/%)	161/46.5	185/53.5	
Women (n/%)	172/93.5	138/85.7	0.046
Age (mean/SD)	40.6/12.9	44.3/11.2	0.004
Profession (%)*	168/90.8	147/93.0	0.453
Work experience (mean/SD)	14.2/10.7	17.4/11.0	0.007
Knowledge in caring for people with dementia (mean/SD)	69.3/18.1	70.3/18.3	0.585
Ratings of caring climate (mean/SD)	62.5/22.2	71.5/19.4	0.000
Opportunities to have ethical discussions (%)	14.9	55.5	0.019
Residents (n/%)	165/48.0	179/52.0	
Women (n/%)	110/66.7	135/79.9	0.073
Age (mean/SD)	83.0/7.6	81.4/8.0	0.068
ADL Score (4–24) mean/SD	10.8/5.0	13.3/5.4	0.000
Orientation Score (mean/SD)	10.4/6.8	10.4/7.6	0.980
Communication – normal speech (n/%)	82/49.7	120/67.0	0.005
Motor ability – walks independently (n/%)	68/41.2	109/60.9	0.001

Note: *Nursing Assistant or Licensed Practical Nurse

being significantly less positive ($p = 0.000$), and reported fewer opportunities to discuss ethical conflicts and challenges at work ($p = 0.019$). Residents in the 20 units with highest job strain scores had significantly lower ADL scores ($p = 0.000$) and lower communicative ($p = 0.005$) and motor abilities ($p = 0.001$). The prevalence of behavioral symptoms was fairly high among residents in the sample. Table 2 shows that 92.2% of residents in the sample exhibited some behavioral symptom at least once a week. The most frequently occurring behavioral symptom was verbally disruptive behavior (65.1%), followed by aggressive behavior (63.7%), wandering behavior (46.2%), restless behavior (39.0%), escape behavior (37.8%), and regressive behavior (25.6%).

Analyses of associations between work characteristics of residential care nursing staff and prevalence of behavioral symptoms among people with dementia residing in the same settings was conducted. In relation to the first hypothesis, it was found that verbally disruptive behavior was significantly more prevalent ($p = 0.027$) in units where nursing staff rated their job strain as being higher compared to units where staff rated their job strain as lower. No other

Table 2. Prevalence of behavioral symptoms in the sample (n = 344)

	N (%)
Any behavioral symptom	317 (92.2)
Verbally disruptive behavior	224 (65.1)
Shrieks and shouts continuously	64 (18.6)
Constantly seeks attention from staff	212 (61.6)
Aggressive behavior	219 (63.7)
Resists being dressed and undressed	127 (36.9)
Aggressive threats (words or gestures) to patients/staff	154 (44.8)
Hits patients/staff	89 (25.9)
Spits out drugs	91 (26.5)
Wandering behavior	159 (46.2)
Lies in other patients' beds	33 (9.6)
Piles up chairs, pushes tables, upends furniture	43 (12.5)
Wanders back and forth alone or with other patients	133 (38.7)
Restless behavior	134 (39.0)
Tears up newspapers, etc.	57 (16.6)
Rolls up table cloths	84 (24.4)
Mixes up food	92 (26.7)
Eats potted soil, cigarette butts, etc.	13 (3.8)
Escape behavior	130 (37.8)
Packs up his/her things, tries to go home	57 (16.6)
Hides things	91 (26.5)
Often stands at the outer door wanting to go out	79 (23.0)
Regressive behavior	88 (25.6)
Undresses in the dayroom	40 (11.6)
Smears feces on clothes, furniture, etc.	56 (16.3)

behavioral symptoms were significantly different when comparing the 10 units with lowest job strain scores with the 10 units with highest job strain scores, or when comparing the first (n = 4) and tenth (n = 4) deciles of low and high scoring units.

In relation to the second hypothesis, the prevalence of behavioral symptoms among residents in units where staff rated the caring climate as being less positive was compared to the prevalence of behavioral symptoms in units rated as having a more positive caring climate. This was the hypothesis that received the strongest statistical support. Wandering behavior was significantly more prevalent ($p = 0.041$) in units where the caring climate was rated least positive (n = 20) as compared to units where the caring climate was rated as most positive (n = 20). When comparing the four units (10%) with the least positive climate ratings with the four units (10%) with the most positive climate ratings, the following behaviors were significantly more prevalent in least positive climate units: escape behavior ($p = 0.028$), restless behavior ($p = 0.027$), and wandering behavior ($p = 0.001$).

The third hypothesis of the study was that units where nursing staff rated their level of knowledge in caring for people with dementia as being low would have a higher prevalence of behavioral symptoms among residents, as compared to units in which nursing staff rated their levels of knowledge as being high. No statistical support was found for the third hypothesis.

Discussion

The aim of this study was to investigate associations between work characteristics of nursing staff and prevalence of behavioral symptoms among people with dementia in residential care settings. The results show that people with dementia residing in settings where nursing staff reported lower job strain showed significantly less prevalence of verbally disruptive behaviors compared to settings in which staff experienced higher job strain. It was also found that residents in settings characterized by nursing staff having a more positive caring climate exhibited significantly less prevalence of escape, wandering and regressive behaviors compared to residents in settings rated as having a more negative caring climate.

The results also show that the prevalence of behavioral symptoms and staff members' self-reported knowledge in caring for people with dementia was not associated. However, the data show that residents in units with the highest job strain had significantly lower capabilities to perform activities of daily life, exhibited significantly lower abilities to walk independently, and had less capacity to communicate verbally. It seems reasonable to acknowledge that this might contribute to the higher job strain of staff in those units, as increasing dependency among residents is expected to add to the job strain of staff. Nevertheless, decreased functional abilities also mean an increased inability to exhibit certain motor behaviors, for example wandering, even though behaviors such as screaming continue longer as the disease progresses.

One possible interpretation for the higher prevalence of behavioral symptoms in settings with high job strain is that staff members who experience strained work characteristics have been shown to distance themselves from residents (cf. Norberg *et al.*, 2002). Such a distance between residents and nursing staff can create a sense of insecurity among residents rather than that of safety (Kitwood, 1997). Thus, the significantly higher prevalence of behavioral symptoms in strained and less caring environments might be interpreted as residents' expressions of insecurity due to strained and possibly distant nursing staff.

The caring climate of units and its effects on residents and staff is an issue in need of further study within dementia care. This study shows that the prevalence of behavioral symptoms was significantly higher in settings where nursing staff rated the caring climate as being less positive compared to settings rated as having a more positive caring climate. However, even though knowledge of how to create and maintain a positive caring climate is not clear, previous research supports the argument that a climate of well-being is important for people with dementia. For example, it has been described that emotional memories are more lasting than cognitive memories for people with dementia, and that these emotional

memories are used to interpret and communicate experiences in the present (Kitwood, 1997). Thus, a caring, calm, friendly and inviting climate might facilitate well-being and experiences of safety, whereas a stressful, hostile and unwelcoming climate might obstruct well-being among residents. The concept "caring climate" has been explored in non-dementia specific settings, and findings show that the climate is experienced as caring when persons experience a calm pace, when they are approached as persons in familiar environments, where there is a shared philosophy of care, a possibility of creating and maintaining social relations, and where available and trustworthy staff show a generous and welcoming approach (Edvardsson *et al.*, 2005). Further studies into how a caring climate is experienced, created, maintained and measured within dementia care are needed.

No statistical support was found for the third hypothesis that units in which nursing staff rate their knowledge in caring for people with dementia as greater will have less prevalence of behavioral symptoms among residents. However, it has been suggested that nursing staff who perceive themselves to be better trained in dementia care are more likely to espouse person-centered care and have higher job satisfaction (Zimmerman *et al.*, 2005), and that training staff who care for people with cognitive impairments can improve resident well-being (Lintern *et al.*, 2000). The findings of this study are somewhat contradictory to those findings, as higher self-reported knowledge in caring for people with dementia among nursing staff was not significantly accompanied by a lower prevalence of behavioral symptoms in residents. These conflicting findings indicate a need for further inquiry. One question of interest is whether different kinds of knowledge are equally influential in providing good care for people with dementia. For example, is knowledge about facts – for example, symptoms, risk factors, diagnoses and treatment – less, equally or more important to care outcomes than experience-based knowledge of the lived world and life history of people with dementia? Can knowledge about – and willingness to perform – ethical reasoning and moral behavior have a positive impact on outcomes for residents and staff? The concept of knowledge encompasses such a multitude of meanings, and perhaps a greater specificity and operationalization of this concept could enrich our understanding of its association with health outcomes in people with dementia and nursing staff. It has been shown, for example, that a person-centered view of people with dementia was more influential in recognizing cognitive difficulties among people with dementia than both education and experience (MacDonald and Woods, 2005) and that knowledge about the life history, personality and progression of the disease was declared by staff to be of great importance in interpreting needs and providing good individualized care to people with dementia (Berg *et al.*, 1998)

In studies focusing on the care of people with dementia, it has been noted that nursing staff need to have adequate opportunities at work to discuss the challenges and ethical conflicts they face; if staff do not have such opportunities it negatively affects their job satisfaction and increases stress (Hallberg and Norberg, 1995; Brodaty *et al.*, 2003). By contrast, work-based discussions have been found to increase creativity and reduce degrees of burnout among staff (Berg *et al.*, 1994), and improve comfort and co-operation within the

work-group (Hallberg *et al.*, 1994). This study supports previous findings that the opportunity to hold discussions concerning ethical conflicts and difficulties benefits staff well-being as measured in the job demand-control model.

Limitations of the study

Because of the cross-sectional nature of the data, it is not possible to assess whether higher levels of job strain among nursing staff results in higher prevalence of behavioral disturbances among residents, or whether it is the opposite – higher prevalence of behavioral disturbances among residents results in higher levels of job strain among staff. Similarly, it is not known whether a more positive caring climate results in a lower prevalence of behavioral disturbances among residents, or if a lower prevalence of behavioral disturbances creates a more positive climate. Further research is required to test the direction of associations between work characteristics of staff and resident behaviors to see whether introducing interventions to improve caring climate will reduce behaviors and job strain. Further study is also required to investigate the role and content of education and its impact on care. Nevertheless, this study shows that the situation of staff (job strain and caring climate) is associated with well-being of residents as measured by the prevalence of behavioral disturbances. Is it possible to interpret the findings as merely suggesting that more severe dementia produces more severe BPSD which leads to higher job strain for staff? As shown in Table 1, no significant differences were found in orientation scores between the groups, indicating that the severity of dementia as measured by orientation ability was comparable between the two groups. However, only univariate analyses were employed in this study, and thus adjustments for multiple comparisons were not made. Further studies that can control for the influence of multiple variables in exploring predictors of behavioral symptoms would be valuable. For example, it has been shown in previous work that there is a relationship between facility size and BPSD (Brodaty *et al.,* 2002), and this would have been interesting to explore further in this study if data on unit size had been collected.

The use of "caring climate" and "self-reported knowledge in caring for people with dementia" as explanatory variables in this study is based on previous findings that the caring climate influences both staff and resident well-being (Edvardsson *et al.,* 2005: Sandman *et al.,* 2006), and that staff knowledge seems to have effects on resident well-being (Lintern *et al.*, 2000; Zimmerman *et al.*, 2005). However, further studies exploring the predictive and causal effects of these two variables on staff and resident well-being are needed before firm conclusions can be made. To summarize, the limitations of this study indicate that the results should be regarded as indicative rather than conclusive.

Conclusions

This study provides some evidence for the often-cited clinical experience that the well-being of nursing staff is associated with the well-being of people with

dementia in residential care settings. The findings showed that there were significantly fewer behavioral symptoms among people with dementia residing in environments where nursing staff experienced lower job strain and had a more positive caring climate. This study illuminates the interaction that exists between the well-being of nursing staff and the well-being of residents, and increases our understanding of what constitutes a caring environment for people with dementia. Although the cause and effect remains to be established, this study cautiously suggests the following practice interventions:

1. The establishment of a caring, calm, friendly and inviting climate where social relationships are valued and people are more important than getting "the tasks done quickly."
2. The development of a culture in which staff feel valued and team spirit is encouraged.
3. The establishment and ongoing support for the development and maintenance of staff competencies in dementia care;
4. The provision of opportunities for discussion and constructive debate of ethical issues and conflicts that arise in practice.

Conflict of interest

None.

Description of authors' roles

D. Edvardsson analyzed data and wrote the paper, P. O. Sandman interpreted data and wrote the paper, R. Nay interpreted data and wrote the paper, S. Karlsson designed the study, recruited subjects, collected data and wrote the paper.

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