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Impact of Three Dementia-Related Behaviors on Caregiver Depression: The Role of Rejection of Care, Aggression, and Agitation

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Abstract

Objective: The relationship of specific dementia-related behaviors to caregiver depression and moderating factors is unclear. We examined the role of rejection of care, aggression and agitation to caregiver depression and if social support and mastery independently moderated associations.

Methods: Cross-sectional, secondary analysis using baseline data from two community-based clinical trials. We examined frequency of occurrence of presenting behaviors and their combinations in persons with dementia. Multiple logistic regression analyses examined associations between non-overlapping behavioral clusters (agitation alone, agitation + rejection, agitation + aggression, and agitation + rejection + aggression) and caregiver depression. Multiple logistic regression with interaction terms was also used to investigate whether social support or caregiver mastery moderated the relationship between behavioral symptom clusters and caregiver depression.

Results: Three of four symptom clusters (all three behaviors [AOR=2.22, 95% CI=1.02–4.83], agitation + rejection of care [AOR=2.55, 95% CI=1.06–6.13], and agitation + aggression [AOR=2.63, 95% CI=1.17–5.89]) had a positive association with caregiver depression, whereas agitation alone was not significantly associated with caregiver depression. Neither social support nor mastery significantly moderated the relationship between these three behavioral clusters and caregiver depression.

Conclusion: Caregiver depression was associated with different combinations of behaviors but not with agitation alone. These results have implications for intervention development and identifying caregivers at risk for depression. Level of social support and mastery do not appear to moderate impact on caregiver depression.

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Keywords

dementia; caregiver depression; rejection of care; aggression; agitation

INTRODUCTION

Along with cognitive and functional impairment, behavioral symptoms are increasingly recognized as a key clinical feature of dementia. Behavioral symptoms affect nearly all persons living with dementia at some point in their disease course.¹ Behavioral symptoms are highly challenging for persons with dementia, caregivers, and providers as they are associated with greater caregiver burden,² increased risk for nursing home placement,³ prolonged duration of inpatient treatment,⁴ and decreased quality of life.⁵ Moreover, behavioral symptoms are reported to be more stressful for caregivers than other aspects of the disease process such as cognitive decline.⁶

Three commonly occurring behaviors include rejection of care, aggression, and agitation. Although these behaviors are often grouped together or subsumed under agitation, distinguishing them is important for intervention development because they may have a differential impact on family caregivers.⁷

For example, caregivers tend to find aggressive behaviors difficult to deal with, emotionally distressing, and potentially dangerous and, as a result, they often feel powerless, sad, and ineffective.⁸ Rejection of care can also distress caregivers as it interferes with provision of necessary care. Especially spousal caregivers with emotional investment in their relatives may find this behavior more upsetting and disheartening than other types of behaviors. On the contrary, agitated behaviors that are not directed toward others (e.g., pacing, repetitious mannerism) may be annoying but not as stressful as aggression or rejection of care to caregivers.

Although little is known about whether these three behaviors differentially impact the caregiver, there is evidence that they have a particular pattern in their co-occurrences and that the resulting behavioral clusters (i.e., one or more co-occurring behaviors grouped together) have different relationships with various clinical variables such as cognitive and functional impairment.⁹

By clearly differentiating the underdefined behaviors and examining their differential effects on dementia caregivers, researchers and clinicians could have a potential opportunity to identify vulnerable caregivers and target interventions to better meet their needs and their relatives'.

This study was guided by the stress process model¹⁰ which conceptualizes the stress process as having three components. *Stressors* are the challenging conditions experienced by caregivers. *Outcomes* refer to the consequences of stressors such as the effects of behavioral symptoms on caregivers' well-being. *Moderators* are the third component which may serve as a stress buffer. In the literature on stress, social support and mastery (sense of control over one's life circumstances) are regarded as protective factors for caregivers' mental health.¹¹

Stress process model specifies these two factors as stress buffers which may attenuate the strength of the relationship between a stressor and an outcome. The framework suggests that the positive relationship between stressors (behavioral symptoms) and negative consequences (caregiver depression) can be attenuated by social psychological resources (social support or caregiving mastery) such that the magnitude of the association may increase with plentiful socioeconomic resources and decrease with a lack of such resources. For example, caregivers reporting more social support or higher levels of perceived control over the caregiving situation may experience less upset and depressive symptoms.

The primary aim of this study was to examine the relationship between three distinct behavioral symptoms (rejection of care, aggression, and agitation) in community-dwelling persons with dementia and caregiver depression using baseline data from two clinical trials. The secondary aim was to determine if social support and caregiving mastery each independently moderated the association between behavioral symptoms and caregiver depression. Earlier stress research indicated that high levels of social support and mastery were related to low levels of the caregiver's emotional distress.^{10,12} Unlike past research which mostly examined their direct buffering effects, in this study we examined the conditional effects of social support and mastery (e.g., whether certain combinations of behavioral symptoms were especially distressing to caregivers with low levels of resources compared to high levels of resources). This study was conceptualized as exploratory and there were no *a priori* hypotheses regarding which behaviors and their co-occurrences would have deleterious effects on caregivers. However, we did anticipate that higher social support and feelings of mastery would diminish the negative impact of behavioral symptoms on caregiver depression.

METHODS

Sample

The current study is a secondary analysis of two different community-based datasets combined for the purpose of this study. Project ACT¹³ was a randomized controlled trial designed to test the effectiveness of a home-based intervention to minimize targeted behaviors of persons with dementia. COPE¹⁴ was a 4-month, home-based, nonpharmacological intervention designed to improve functional independence in persons with dementia and caregivers' well-being. The present study used baseline data (N=509) before randomization and exposure to the treatment in both trials.

Participants were recruited in the Philadelphia region between March 2006 and June 2008 (ACT) and between December 2003 and March 2007 (COPE) from media announcements and mailings. The inclusion and exclusion criteria have been fully described elsewhere.^{13,14} Briefly, for both trials caregivers were living with people with a physician diagnosis of dementia or Mini-Mental State Examination (MMSE)¹⁵ scores of 23 or less. Caregivers also reported being upset (>5 on a 10-point scale) for managing problem behaviors (ACT) or difficulty managing patient functional decline or behaviors (COPE).

Measures

Outcome measure.—Depressive symptomatology of caregivers was measured using the Center for Epidemiological Studies-Depression Scale (CES-D 10).¹⁶ The CES-D 10 is a 10-item measure that asks caregivers about their experience of symptoms related to depression in the past week such as feeling depressed, feeling lonely, and restless sleep. Higher scores on the CES-D 10 indicate greater depressive symptomatology. Caregivers who scored 10 or greater were categorized as being at risk for clinical depression (Cronbach's $\alpha=0.79$).

Behavioral symptoms.—In each trial, behavioral symptoms were measured by the Agitated Behavior in Dementia Scale (ABID).¹⁷ ABID is a 16-item caregiver-based rating scale designed to assess commonly observable behaviors in persons with dementia. The measure has excellent internal consistency (0.70), adequate test-retest reliability (0.60–0.73), and construct validity confirmed by correlations with related measures.¹⁷ Each behavior is rated by a caregiver for its presence or absence during the past month. There is no sub-scale for rejection of care, aggression, or agitation in the ABID. Therefore, dichotomous items were selected and combined to characterize the presence or absence of each of these behaviors. Item selection was mainly based on categorization of items in the corresponding subdomains of the Neuropsychiatric Inventory-Clinician (NPI-C)¹⁸ rating scale and factor analysis was not performed due to its limited usefulness in producing a clinically meaningful factor structure.¹⁹ The construct validity of the behavioral symptom measures, however, was confirmed by the judgment of a panel of seven experts in dementia care.

Rejection of care was assessed by a single item, 'refusing to accept appropriate help.'

Aggression was measured on the basis of four ABID items ('aggressive to others verbally', 'aggressive to others physically', 'doing things harmful to him/herself', and 'destroying property'). These behaviors have similarly been labeled as aggressive on the NPI-C and other measures.⁸ A positive response to any of these items was considered an indication of the presence of aggressive behavior.¹⁸

Agitation was consisted of 6 items ('screaming or crying out inappropriately', 'trying to leave home inappropriately', 'arguing, irritable, or complaining', 'restless', 'worrying, anxious, or fearful', and 'easily agitated or upset'). These items have been identified by other measures such as Neuropsychiatric Inventory (NPI)²⁰ and NPI-C¹⁸ representing this domain of behavior. Agitation item selection was also guided by Volicer et al.'s²¹ proposition that agitated behaviors should not be directed toward others.

Other objective stressors.—A variety of non-behavior objective stressors were examined. Cognitive status of the person with dementia was assessed using the MMSE and functional status was assessed using the Caregiver Assessment of Function and Upset scale (CAFU),²² a 15-item multidimensional measure of functional independence in persons with dementia. Pain of the person with dementia was assessed using 4 pain-related items of the NIH Resources for Enhancing Alzheimer's Caregiver Health (REACH) battery.²³ Caregivers were asked to rate the pain of the person with dementia: over the past few weeks, right now, pain at its worst, and pain interfering with the daily activities, using a 5-point Likert scale response for each item ranging from "not at all" to "extremely".

Background variables.—Person with dementia age, race, gender, and marital status were recorded. Caregiver age, race, gender, marital status, highest level of education, and relationship to the person with dementia were also examined.

Moderator variables.—Social support was assessed using the modified version of the Lubben Social Network Scale-Revised (LSNS-R)²⁴ which is designed to measure perceived social support received by family and friends. This version of scale consists of an equally weighted sum of 13 items used to measure size, closeness, and frequency of contacts of a respondent's social network. A higher score indicates more social support and engagement (Cronbach's $\alpha=0.79$).

Caregiving mastery was assessed by the six-item Caregiving Mastery Index²⁵ which measures the caregiver's perceived competence in providing care (e.g., "How often do you feel you are able to handle most problems in the care of your care receiver?"). Response options of this 5-point Likert scale range from "never" to "always". Higher scores indicate greater levels of caregiving mastery. Cronbach's α for our sample was 0.577.

Analysis

We created non-overlapping groups of persons with dementia exhibiting combinations of the three behaviors⁹ and examined the associations between 4 resulting symptom clusters and caregiver depression using multiple logistic regression analyses. First, the association between each symptom cluster identified by a dummy variable and caregiver depression was examined while controlling for other symptom clusters. Then the covariates were entered on this model. To determine which variables should be included as covariates, bivariate associations between potential confounders (i.e., background characteristics) and the outcome variable (i.e., caregiver depression) were assessed. Variables which had a significant bivariate relation to the outcome variable at the 0.10 level and were not highly correlated with other variables (correlation>0.5) were included in the final model. Behavioral clusters that were manifested by less than 2% of the persons with dementia were excluded from the analysis as we judged that to be too small a cluster.

Moderation effects can be described as an interaction term between a predictor and a moderator.²⁶ A moderator effect is present whenever the interaction is significant. Consistent with the conceptual domain of stress buffering, social support and mastery were considered as moderators that may modify the relationship between stressors (i.e., behavioral symptoms) and caregiver outcome (i.e., depression). The candidate moderator variables (social support and mastery) were dichotomized based on the median of each variable to form "high" and "low" categories (dummy variables) as there were no standard cut-points available. Interaction terms between each behavioral cluster and a dummy variable were created and entered separately as well as simultaneously such that caregiver depression was regressed onto three blocks of variables: behavioral clusters, background characteristics, and a moderator with its interaction term. All statistical analysis was performed using SPSS ver 24.0 with two-sided alpha of 0.05.

RESULTS

Background Characteristics

Table 1 shows the descriptive characteristics of the study sample. People with dementia were predominantly women (61.3%), White (71.3%), and, on average, 82.6 years old ($SD=8.5$). Caregivers were predominantly women (82.9%), White (71.1%), 65.2 years old ($SD=12.5$), married (67.2%), and well-educated (80.8% > high school). Caregivers were most likely to be husband (33.0%), wife (10.8%), daughter (23.8%), son (2.6%), and other relatives (3.6%).

Behavioral clusters

As summarized in Table 2, behavioral symptoms were reported in the vast majority of persons with dementia (95.1%). Although there was a significant co-occurrence among rejection of care, aggression, and agitation, we were able to obtain four non-overlapping groups of persons with dementia who exhibited different combinations of these behaviors. The occurrence of the three behaviors together has been the most common (39.9%) compared to frequency for any one behavior alone or combinations of two behaviors, followed by agitation+aggression (22.0%), agitation alone (17.9%), and agitation+rejection of care (12.6%). Rejection alone (1.2%), aggression alone (0.8%), and rejection+aggression (0.8%) rarely occurred and were excluded from the final analysis.

Multiple Logistic Regressions Predicting Caregiver Depression

We examined associations of each of the four symptom clusters with caregiver depression adjusting for all other clusters and after simultaneously controlling for covariates (caregivers' age, marital status, and education) (Table 3). In both models, each symptom cluster had a positive association with caregiver depression except agitation alone, which did not show any significant association with caregiver depression. For the symptom clusters that had a significant relation with caregiver depression, their magnitude of effect was in relatively close range, with all three (AOR=2.22, $p<0.05$), agitation+rejection (AOR=2.55, $p<0.05$), and agitation+aggression (AOR=2.63, $p<0.05$).

Test of Moderation

Social support (AOR=0.43, $p<0.001$) and mastery (AOR=0.34, $p<0.001$) each had a negative association with caregiver depression as anticipated, indicating that caregiver social support and mastery may be protective factors for caregiver depression. The correlations between behavioral clusters (except agitation alone cluster) and caregiver depression remained significant after adjusting for social support or mastery. Yet, in the final model where social support and mastery were simultaneously entered, only agitation+aggression predicted caregiver depression (AOR=2.38, $p<0.05$) with all three (AOR=2.10, $p=0.070$) and agitation+rejection (AOR=2.47, $p=0.052$) both approaching the borderline of significance (Table 4).

No interaction terms were significant at pre-specified $\alpha=0.05$ when they were sequentially entered into the multiple logistic regressions. In the final model, all of the eight interaction terms were added simultaneously, which showed no statistical significance either. Neither social support nor mastery significantly moderated the relationship between behavioral clusters and caregiver depression.

DISCUSSION

In this study membership in three behavioral clusters (all three, agitation+rejection of care, and agitation+aggression) were associated with greater odds of caregiver depression. Since aggression has been one of the most frequently cited symptoms associated with caregiver depression in the literature,²⁷ aggression may have been a driving factor in these associations. Among the three clusters, agitation+aggression had the strongest effect (OR=2.63, $p=0.019$) on caregiver depression when holding all other predictors constant, although the differences in their odds ratios were small. This is the group of caregivers who did not report any rejecting behaviors by the person with dementia. The majority of aggressive incidents in persons with dementia occur during personal care provided by caregivers.²⁸ Aggression which is not provoked by a caregiving activity may be quite stressful for caregivers because of their unpredictability. Researchers have previously suggested that dementia caregiver's increased stress may be mainly due to capricious nature of problem behaviors of the person with dementia.²⁹

Noteworthy is that agitation+rejection was significantly related to greater likelihood of caregiver depression (OR=2.55, $p=0.036$) while agitation alone had no relationship with caregiver depression. What makes rejection of care so distressful for caregivers? Research suggests that rejection of care often occurs when the person with dementia does not understand or misunderstands the caregiver's intent to provide care.³⁰ Rejection of care per se may not necessarily disturb people with dementia unless care is persistently offered despite their rejection. However, it can have tremendous implications for caregivers' mental well-being. Especially for the spousal caregivers who have developed physical and emotional closeness with their counterparts over their lifetime, non-normative behavior such as rejection of care may be a main source of stress as it indicates a dramatic personality change. Moreover, prior research of a population-based sample of older adults caring for disabled spouses found that simply being able to give care for a disabled spouse can have beneficial effects on the caregiver.³¹ Rejection of care can have deleterious effects on the caregivers' mental health because it may take away the opportunity for them to be supportive of their care receivers.

It should be noted that agitation alone was the only symptom cluster that was not associated with caregiver depression. This may be explained by the 'wear and tear' hypothesis³² which suggests that caregiver's stress related to management of behavioral symptoms increases over time, resulting in increased risk for depression. Agitation may have an earlier onset than the other behaviors. Volicer et al.²¹ reported that agitation was reported in persons with even mild cognitive impairment while rejection of care was rare in those people but its occurrence increased with the severity of dementia. It is possible that caregivers reporting only agitation without rejection of care or aggression did not care for their family members long enough for it to take a toll on their mental well-being. In fact, post-hoc analysis showed that caregivers in the agitation alone cluster reported an average of 3.25 years of caregiving compared to 4.60 years in agitation+rejection, 3.83 years in agitation+aggression, and 4.64 years in all three behaviors cluster. Also, agitation may not be as challenging or threatening to caregivers as aggression or rejection may be. Prior studies examining predictors of

caregiver's negative mental health outcomes showed that aggression was more strongly associated with caregivers' depressive symptoms and caregiver burden than agitation.^{33,34}

Lastly, the moderation model showed no evidence of moderating effect of social support or caregiving mastery on the association between behavioral clusters and caregiver depression although both social support (OR=0.43, $p < .001$) and caregiving mastery (OR=0.34, $p < .001$) were found to be significant protective factors for caregiver depression. Consistent with the stress process model, we expected these two resources to moderate the effect of behavioral symptoms on the mental health outcome. A possible explanation for this unexpected result is that the artificial dichotomization that we used to reduce these moderator variables may have resulted in loss of information.³⁵ It is also possible that moderation effects were not properly reflected in the logistic regression which subjected the dependent variable to a non-linear transformation.³⁶

The finding that there was a clear difference between agitation alone and the rest of the behavioral clusters in their associations with caregiver depression suggests that distinguishing behaviors that occur during caregiver interactions from behaviors that are not provoked by caregivers may be important. To be able to identify caregivers at risk of depression, researchers should consider using an assessment tool that takes into consideration the context in which behaviors occur.

While there are few or no effective interventions to slow the progression of cognitive impairment in dementia, when it comes to behavioral symptoms, there are a range of interventions designed to manage behavioral symptoms and reduce caregiver distress.^{37,38} Multicomponent nonpharmacological treatments including caregiver education and support, training in problem solving, and identifying and addressing underlying causes for specific behaviors have been shown to be effective in managing behavioral symptoms and improving quality of life of the persons with dementia as well as their caregivers.¹³ Additionally, a home-based intervention involving care management, referral and linkage, stress reduction techniques, depression education and symptom recognition, and behavioral activation was found to reduce depressive symptoms and enhance quality of life in most older African Americans although these were not dementia caregivers.³⁹

Our findings have implications for dementia care services and health care professionals. Since symptom clusters have a differential impact on the caregiver's mental health, one should first distinguish rejection of care, aggression, and agitation in persons with dementia to determine specific clusters of these behaviors and then focus intervention efforts on those who are at higher risk for depression (i.e., caregivers who report not only agitated type behaviors but also rejecting and/or aggressive behaviors).

There are several limitations to this study. Because of the cross-sectional design, it is impossible to determine the causal relationship between behavioral clusters and caregiver depression. There is a possibility that caregiver's depressive state may have increased the potential for behavioral symptom presentation. Previous research suggested that caregiver distress and burden may be risk factors of aggressive behaviors of the person with dementia.⁴⁰ Another limitation of the study is the proxy measure of behavioral symptoms. Our data

were based on the caregivers' reporting. Besides potential for recall bias, caregivers' recognition and interpretation of behaviors may have been confounded by their emotional state or cultural beliefs. Also, there may be other variables that can affect the associations. For example, frequency, severity, or appraisal of behavioral symptoms were not examined in this study which may be important predictors of caregivers' depressive symptoms.

CONCLUSION

This study suggests that certain combinations of behaviors involving rejection of care, aggression, and agitation may differentially impact caregiver depression. Caregivers who reported the presence of agitated behaviors without reporting any other behavioral symptoms in persons with dementia had less risk of depression while all other behavioral groups were associated with the increased likelihood of caregiver depression. However, differences in the magnitude of their impacts on caregiver depression were small among these clusters. Our results have implications for developing targeted interventions for caregivers who report symptom clusters. While no moderation effects of social support or mastery were found, other factors may attenuate the relationship between behavioral symptoms and caregiver depression that should be pursued in future research. Our study was exploratory and should be confirmed using validated clinical data with a longitudinal design.

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Key Points

- The authors examined the relationship of three behavioral symptoms (i.e., rejection of care, aggression, and agitation) as well as their co-occurrences in community-dwelling persons with dementia and caregiver depression.
- Three behavioral clusters reflecting the co-occurrences of these behaviors (i.e., agitation + rejection of care, agitation + aggression, and all three behaviors) were found to be associated with increased risk of caregiver depression but not agitation alone.
- Caregivers of persons with dementia exhibiting specific combinations of behaviors (i.e., agitation + rejection of care, agitation + aggression, and all three behaviors) may benefit from depression screening.

TABLE 1.

Characteristics of the Sample (N=509)

Characteristic	Person with dementia	Caregiver
Age, mean $\pm$ SD, years	82.6 $\pm$ 8.5	65.2 $\pm$ 12.5
Gender (female), %	61.3	82.9
Race, %		
White	71.3	71.1
African-American	26.5	26.5
Other	2.2	2.4
Education (years)		
High school or less		19.3
Some college		28.1
College or more		52.7
Marital status (married), %	47.9	67.2
Kin relationship of CG to PwD, %		
Husband		33.0
Wife		10.8
Son		2.6
Daughter		23.8
Other		3.6
Unknown		26.3

Notes: CG: caregiver; PwD: person with dementia

TABLE 2.

Proportion of Persons with Dementia Experiencing Combinations of Behavioral Symptoms

Behavior Cluster	Frequency	Percentage
All three ^a	203	39.9
Agitation + Rejection	64	12.6
Agitation + Aggression	112	22.0
Rejection + Aggression	4	0.8
Rejection alone	6	1.2
Aggression alone	4	0.8
Agitation alone	91	17.9
None	25	4.9

Notes: Percentages are based on the total sample (N=509).

^a Agitation + Rejection of care + Aggression

TABLE 3.

Summary of Multiple Logistic Regression Analyses Predicting Caregiver Depression (N=509)

	Model 1^a			Model 2^b		
	AOR	p	95% CI	AOR	p	95% CI
All three	2.47	0.018	1.17–5.23	2.22	0.043	1.02–4.83
Agitation + Rejection	2.71	0.022	1.16–6.36	2.55	0.036	1.06–6.13
Agitation + Aggression	2.73	0.013	1.24–6.02	2.63	0.019	1.17–5.89
Agitation only	1.38	0.441	0.61–3.13	1.24	0.613	0.54–2.89
Caregiver age				1.01	0.134	1.00–1.03
Caregiver marital status				0.68	0.068	0.45–1.03
Caregiver education						
High school or less				-	0.002	-
Some college				0.48	0.003	0.30–0.79
College or more				0.55	0.006	0.36–0.84
Nagelkerke R Square		0.033			0.086	

Notes:

^aAdjusted for other behavior symptom clusters without covariates^bAdjusted for other behavior symptom clusters and covariates (CG age, CG marital status, and CG education)

AOR = adjusted odds ratio; CI = confidence interval

TABLE 4.
The Moderating Effect of Social Support and Mastery on the Association Between Behavioral Clusters and Caregiver Depression (N=509)

	Model 1 ^a			Model 2 ^b			Model 3 ^c		
	AOR	p	95% CI	AOR	p	95% CI	AOR	p	95% CI
All three	2.29	0.039	1.04–5.00	2.05	0.078	0.92–4.56	2.10	0.070	0.94–4.70
Agitation + Rejection	2.76	0.025	1.13–6.71	2.29	0.072	0.93–5.65	2.47	0.052	0.99–6.15
Agitation + Aggression	2.56	0.024	1.13–5.79	2.42	0.037	1.05–5.56	2.38	0.043	1.03–5.50
Agitation only	1.21	0.660	0.52–2.83	1.09	0.841	0.46–2.61	1.07	0.881	0.45–2.57
Caregiver age	1.01	0.148	1.00–1.03	1.01	0.133	1.00–1.03	1.01	0.157	1.00–1.03
Caregiver marital status	0.71	0.116	0.47–1.09	0.63	0.032	0.41–0.96	0.65	0.056	0.42–1.01
Caregiver education									
High school or less	-	0.002	-	-	0.025	-	-	0.030	-
Some college	0.49	0.004	0.30–0.80	0.54	0.017	0.33–0.90	0.55	0.022	0.33–0.92
College or more	0.54	0.006	0.35–0.84	0.64	0.045	0.41–0.99	0.63	0.046	0.40–0.99
Moderator 1: Social support	0.43	0.001	0.30–0.62		NA		0.43	0.001	0.29–0.63
Moderator 2: Mastery		NA		0.34	0.001	0.24–0.50	0.34	0.001	0.23–0.50
Nagelkerke R Square		0.135			0.162				0.206

Notes:

All models were adjusted for other behavioral symptom clusters and covariates (CG age, CG marital status, and CG education) simultaneously.

None of the interaction terms (i.e., each of the 4 behavioral clusters*social support, each of the 4 behavioral clusters*mastery) was significant and therefore interaction terms were dropped from the models.

^a Adjusted for social support

^b Adjusted for mastery

^c Adjusted for both social support and mastery simultaneously

AOR = adjusted odds ratio; CI = confidence interval