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Caregiver Burden and Health in Bipolar Disorder:

A Cluster Analytic Approach

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Abstract

To identify caregivers at risk for adverse health effects associated with caregiving, the stress, coping, health and service use of 500 primary caregivers of patients with bipolar disorder were assessed at baseline, 6, and 12 months. K-means cluster analysis and ANOVA identified and characterized groups with differing baseline stress/coping profiles. Mixed effects models examined the effects of cluster, time, and covariates on health outcomes. Three groups were identified. Burdened caregivers had higher burden and avoidance coping levels, and lower mastery and social support than effective and stigmatized caregivers; stigmatized caregivers reported the highest perceived stigma ($p < 0.05$). Effective and stigmatized groups had better health outcomes and less service use than the burdened group over time; stigmatized caregivers had poorer self-care than effective caregivers. Cluster analysis is a promising method for identifying subgroups of caregivers with different stress and coping profiles associated with different health-related outcomes.

Keywords

caregiving; profiles; strain; health

Caring for a relative with bipolar disorder poses both objective burdens such as increased expenditure of time and money, and emotional burdens such as worry, tension, and grief (Chakrabarti and Gill, 2002; Fadden et al., 1987; Perlick et al., 1999; Reinares and Vieta, 2004). Perlick et al. (2001) found that 93% of caregivers of patients with bipolar disorder reported a moderate or higher degree of caregiving strain when their relative was admitted to a psychiatric facility, and that 70% continued to report moderate or higher burden 15 months later.

In addition to its impact on quality of life, caregiving strain has been associated with compromised health and mental health among caregivers of patients with major affective and other chronic mental disorders. For example, caregivers who report high levels of caregiving strain also report experiencing poorer general health and a higher number of chronic medical conditions relative to the general population (Gallagher and Mechanic, 1996), as well as increased primary care visits (Perlick et al., 2005), more sleep problems (Perlick et al., 2007), greater use of psychotropic drugs such as tranquilizers and antidepressants (Dyck et al., 1999), and increased risk of medical hospitalization (Gallagher and Mechanic, 1996). Finally, studies have shown that high levels of caregiving strain are associated with clinically significant levels of depressive symptoms (Coyne et al., 1987; Dyck et al., 1999; Struening et al., 1995).

The causal links between caregiving strain, adverse health effects and increased service use have not been clearly elucidated. Studies have demonstrated an association between various forms of psychological stress and health complaints and/or use of primary care services (e.g., Katon, 1984; Olfson and Klerman, 1992; Salovey et al., 2000), and studies among caregivers have suggested that those who experience high levels of strain are low in coping self-efficacy or employ less effective coping strategies, which have in turn been linked to poor health practices and poor subjective general and mental health. For example, caregivers reporting high strain tend to use emotion-focused coping strategies such as avoidance coping, characterized by emotional reactivity (shouting, throwing things) and wishful thinking (Scazufca and Kuipers, 1999). Similarly, high levels of caregiver burden have been associated with low mastery and perceived control of the patient's problem behaviors (Noh and Avison, 1988), and low mastery and high burden have been associated with higher levels of depression (e.g., Li et al., 1999) and with poorer caregiver health practices (Perlick et al., 2007). Finally, caregiving strain has been linked with low subjective or perceived social support (e.g., Potasznik and Nelson, 1984), and low perceived support has been associated with recurrence of depression (e.g., Brownell et al., 1978) and poorer physical health outcomes for caregivers over time (e.g., House et al., 1988). Studies of burden, coping, and health outcomes for caregivers of patients with major mental disorders are limited in number compared with the much larger number of studies in the literature on dementia caregiving. However, available literature suggests that caregiving strain in psychiatric conditions such as bipolar disorder is related to high stress appraisals and less

adaptive coping practices and health behaviors that may in turn be related to compromises in caregiver health and mental health.

Prior studies have focused on 1 or 2 caregiver attributes with the goal of elucidating the causal and temporal relationships linking these attributes to caregiver health and/or mental health outcomes. In the present study, factor and cluster analysis were used to permit use of a broader array of subjective, experiential and self-reported, behavioral adaptations to caregiving to identify and distinguish subgroups of caregivers with differential risk profiles for the adverse health outcomes which have been related to caregiving in prior studies. Cluster analysis is particularly suited to capturing interactions among the characteristics that define a population, thereby mining more of the inherent structural richness of complex data sets (Sugar et al., 2004). Family members who care for a relative with mental illness must contend with multiple and qualitatively different sources of stress, including stress relating to their relative's illness symptoms and problem behaviors, and stress relating to societal stigmatization of people with mental illness and their families (Struening et al., 2001). Because societally-based stress may be engender different appraisal and coping scenarios than stress based on the caregiver's interactions with the patient him/herself, it was of particular interest to determine whether caregivers with high levels of stress related to perceived stigma would be grouped with caregivers experiencing high levels of stress in relation to problem behaviors, and whether these groups would show similar coping strategies and health outcomes.

Research on mental illness stigma has suggested that caregiver stress related to societal stigma versus caregiver stress related to the illness symptoms themselves would impact differentially on caregiver health behavior and outcomes. Although patients' illness symptoms are clearly external to the caregiver, caregivers and other individuals may internalize the devaluing attitudes of society (Corrigan, 2004; Link et al., 2001), leading to lowered self-esteem and/or other depressive symptoms which have been associated with use of less adaptive caregiver coping strategies and poorer health outcomes.

Using longitudinal data from a large-scale study of family stress and coping in bipolar disorder (Perlick et al., 2003), we aimed to evaluate the following hypotheses: (1) measures of caregiver stress and coping can be aggregated to form distinctive burden/adaptation typologies comprised of different subgroups of caregivers; (2) membership in these subgroups will be associated with significant differences on subjective measures of physical and mental health and health behavior.

METHODS

Participants

Subjects were the primary caregivers of 500 patients with bipolar disorder enrolled in the standard care pathway (SCP) of the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD), a multisite, longitudinal study examining the effectiveness of treatments of bipolar disorder (Sachs and Thase, 2003). The SCP is the naturalistic study component of STEP-BD in which patients' treatment was determined on clinical grounds by their treating physician. All patients recruited into the STEP-BD SCP from August 1, 2002

through December 31, 2003 ($N = 778$) at each of 8 participating sites were invited to enroll in an ancillary study examining the strains associated with caring for a friend or relative with bipolar disorder: the Family Experience Study (Perlick et al., 2007). Altogether, 87.4% or 676 of those invited agreed and were able to identify a family member or friend who qualified as the primary caregiver by meeting 2 (for friends) or 3 (for relatives) of the following criteria established by Pollak and Perlick (1991): (1) is a spouse, parent, or spouse equivalent; (2) has most frequent contact with the patient; (3) helps to financially support the patient; (4) has most frequently been a collateral in the patient's treatment; (5) is a contact for treatment staff in case of emergency. Of the 676 caregivers contacted for the study, 500 (72.5%) agreed to participate and completed the baseline interview. Four hundred four (80.8%) of these completed a 6-month interview and 426 (85.2%) completed a 12-month interview. Overall, 92% ($N = 461$) had 1 or both follow-up interviews. Caregivers who participated did not differ statistically from those who declined or were lost to follow-up on age, gender, education, marital status, relationship to the patient, and whether they lived with the patient.

Procedures

Patient Assessments—The patient's lifetime diagnosis of bipolar disorder (I, II, NOS, and schizoaffective, bipolar type) and current episode status were established by consensus following administration of a standardized affective disorder evaluation (Sachs and Thase, 2003), including a modified version of the mood and psychosis modules from the Structured Clinical Interview for DSM IV diagnosis and the Mini International Neuropsychiatric Interview Version (MINI Plus Version 5.0), a semistructured interview designed to identify current major axis I disorders (Sheehan and Lecrubier, 1998). Two additional measures administered in the course of subsequent routine clinical research visits represented the patient's clinical status and functional level over time. The Clinical Monitoring Form, a semistructured interview, was used to evaluate whether the patient met DSM-IV criteria for an episode of mania, hypomania, major depression or mixed depression within the last 30 days (coded as 1), or was euthymic (coded as 0) (Sachs and Thase, 2003). The GAF score was used to evaluate patients' functional status during the past 30 days.

Caregiver Assessments—Caregivers were interviewed by research assistants on measures of stress, coping, health and mental health at baseline, and were reassessed 6 and 12 months later. Interviews were conducted within 30 days of a patient clinical assessment to evaluate the influence of patient symptoms and functioning on caregiver health outcomes. Stress and coping measures (burden, mastery, perceived stigma, avoidance coping, and subjective support) were chosen based on their ability to predict differences in caregiver health and/or mental health outcomes and behavior before studies. Measures of health outcome and behavior (depressive symptoms, health risk behavior, subjective general health and sleep problems scales, and a service use inventory) were similarly selected based on a demonstrated sensitivity to detect stress-related health problems. Research assistants completed a formal training procedure and their performance was monitored by a PhD psychologist who reviewed audiotape recordings of the first 3 interviews given and every fifth interview conducted thereafter.

Measures of Stress and Coping: Criterion Variables for Cluster Analysis—The Social Behavior Assessment Scale (Platt et al., 1978), a semistructured interview, was used to assess caregivers' experience of objective and subjective burden over the previous 7 months in 3 domains: patient problem behaviors (e.g., violence, unpredictability); patient role dysfunction at work and at home; and adverse effects on others (the impact of the illness on the caregiver's work, social and leisure time). In judging objective burden, caregivers were asked to rate the degree to which each problem was present on a scale of "0" (none), "1" (moderate), or "2" (severe). In judging subjective burden, they rated the degree of distress they personally experienced as a result of each item previously rated as objectively present, using the same scale. Total objective and subjective burden indices were computed by averaging the means of all items in each of the 3 domains. Because the 2 scales were highly correlated ($r = 0.76$), they were combined into a single total burden scale which demonstrated adequate internal consistency (Cronbach's $\alpha = 0.82$).

Caregivers' global perception of the degree of discrimination directed toward caregivers (caregiver-focused stigma) was assessed using the 7-item Devaluation of Consumer Families Scale which describes attitudes toward family members of people with mental illness, e.g., "Most people look down on families that have a member who is mentally ill" (Struening et al., 2001). Items are rated on a 4-point Likert scale with high scores denoting high stigma and summed across items (range: 7–28). Struening et al. (2001) report good internal consistency reliability (Cronbach's $\alpha = .80$).

The Mastery Scale (Pearlin et al., 1981) assessed how much control family members felt they had over events in their lives. Items included, "I can do anything I really set my mind to" and "There is really no way I can solve some of the problems I have." Subjects rated their agreement or disagreement with each of 7 items on a scale from 1 (strongly agree) to 4 (strongly disagree), for a total score ranging from 7 to 28. Avoidance coping was measured using 6 items from the Ways of Coping Questionnaire (Folkman and Lazarus, 1988a, b) as adapted by Sczuzfca and Kuipers (1999). Examples of avoidance coping are, "Avoided other people" and "Tried to take my mind off things by smoking, drinking, or taking pills to relax." Caregivers rated the degree to which they employed each strategy in response to the most stressful situation with the patient in the last month on a scale of 1 (never) to 5 (all the time). Responses were summed across items to generate an overall index ranging from 6 to 36.

The 7-item subjective social support subscale from the Abbreviated Duke Social Support Scale (Koenig et al., 1993; Cronbach's $\alpha = 0.71$) was used to evaluate caregivers' perceptions of available social support. Caregivers were asked to respond to questions such as "Does it seem that your family and friends understand you most of the time, some of the time, or hardly ever?", and the items on this subscale were summed to create a total score ranging from 7 to 21.

Measures of Health and Mental Health (Outcome Measures)—Caregiver mental health was assessed using the Center for Epidemiological Studies of Depression Scale (Radloff, 1977). The Center for Epidemiological Studies of Depression Scale is a 20-item assessment of depressive symptoms that correlates highly with other self-report depression

measures (range: 0.7– 0.8), and displayed good internal consistency in this study (Cronbach's $\alpha = 0.90$). To evaluate sleep problems, caregivers were asked on how many nights in the past 2 weeks they had experienced “trouble” with each of the following: initiating sleep, maintaining sleep, and early morning awakening. The number of nights on which trouble was reported for each sleep problem was summed to create a total sleep problem scale with possible scores from 0 to 42.

The general health scale from the Medical Outcomes Study 36-item Short-Form Health Survey (Ware and Sherbourne, 1992) was used to assess caregivers' perceptions of their overall health status. The Health Risk Behavior Scale (Burton et al., 1997) assessed behavioral health risks of caregiving (e.g., eating less than 3 meals a day, not getting enough rest, forgetting to take medications, missing doctors' appointments). This 9-item measure correlates with perceptions of general health (Ware and Sherbourne, 1992), and demonstrated good internal consistency reliability in the present study (Cronbach's $\alpha = 0.80$). To assess service use, caregivers were asked how many visits they had with each of 16 categories of psychiatric, medical or substance abuse programs during the past 3 months.

Analytic Strategy

Because the dimensions of caregiver experience selected for the cluster analysis represented different phases of the coping process—stress appraisal and coping (Lazarus and Monat, 1991), we first used principal components analysis (Seber, 1984) to evaluate the dimensional structure of these processes, entering each individual's scale scores on each of the 5 measures.

Mean substitution was used for scales with 10% or less of missing item-level data. Next, we converted all measures to Z scores and used k-means cluster analysis (Hartigan, 1978) to construct a parsimonious and data-driven grouping of caregiver burden typologies. The k-means algorithm partitions the data field into nonempty, nonoverlapping regions so that points in different clusters are as widely separated as possible, whereas those in the same cluster are close together (Sugar et al., 2004). The interpretability of the results from 2, 3, and 4-cluster solutions was compared. The 2-group solution was dominated by 1 large cluster, whereas the 4-group solution presented the problem of 2 large and 2 small clusters. We selected the 3-group solution both because participants were more uniformly distributed across clusters and the results of the cluster loadings were more interpretable. Oneway ANOVA followed by Bonferroni post hoc tests for multiple comparisons was used to evaluate differences between criterion variables in different clusters at baseline and differences between caregivers in different clusters on sociodemographic and patient baseline clinical variables. Because α was set at 0.05 for each variable, we divided 0.05 by the number of clusters, yielding a level for each comparison of 0.0166 or 0.02 to correct for test-wise error. However, because this method does not correct for experiment-wise error, we cannot eliminate the risk of a type 1 error. The chi square test for proportions was used to evaluate group differences for categorical variables.

Following conventions for analyzing observational (i.e., nonexperimental) data (Wells, 1999), preliminary bivariate analyses were conducted to identify patient and caregiver sociodemographic and clinical variables that were significantly correlated with the

dependent variables, to both examine and control for their contribution to the longitudinal multivariate models. Measures that had significant bivariate associations at the 0.05 level or better with 2 or more of the 5 outcome measures, or that differed between clusters at the 0.05 level or better were included in all multivariate models. The relationships between caregiver burden/adaptation cluster and health outcome variables were then evaluated using mixed effects models with random slopes and intercepts to permit use of all available data from all time points. These models examined the effects of baseline cluster, time (baseline, 6, and 12 months) and covariates identified as described above on each of the 5 health outcome variables. To allow paired comparison of all 3 groups, the analyses were conducted first with the burdened group as the comparator and then with the effective group as the comparator. An additional set of models used group by time interaction analysis to examine potential differences between clusters in the pattern of change observed over the course of the study. To assess the stability of the cluster solution, the Fisher classification coefficients it generated were applied to the 6- and 12-month data to reclassify caregivers. Each caregiver's scores for the 3 clusters were calculated as follows:

$$\text{Challenged} = -0.02 \times Z_{\text{Stigma}} - 1.02 \times Z_{\text{Mastery}} - 1.35 \times Z_{\text{Support}} + 1.20 \times Z_{\text{Burden}} + 1.51 \times Z_{\text{Avoidance}} - 3.33.$$

$$\text{Effective} = -1.49 \times Z_{\text{Stigma}} + 0.54 \times Z_{\text{Mastery}} + 0.35 \times Z_{\text{Support}} - 0.65 \times Z_{\text{Burden}} - 0.49 \times Z_{\text{Avoidance}} - 2.06.$$

$$\text{Stigmatized} = 2.44 \times Z_{\text{Stigma}} + 0.13 \times Z_{\text{Mastery}} + 0.75 \times Z_{\text{Support}} - 0.11 \times Z_{\text{Burden}} - 0.69 \times Z_{\text{Avoidance}} - 2.51.$$

Each caregiver was assigned to the cluster on which she/he scored highest at each time point, and the percent of caregivers remaining in the original (i.e., baseline) cluster 6 and 12 months later was calculated.

RESULTS

The principal components analysis identified 1 factor on which all variables loaded at 0.45 or better (range = 0.47–0.70), suggesting that the caregiver stress appraisal and coping variables studied were unidimensional in structure. This factor explained 38.5% of the variance. The cluster analysis profile (Table 1) demonstrated that the caregivers in group 1 (burdened caregivers) were characterized by significantly higher levels of burden and avoidance coping, and lower levels of mastery and social support relative to caregivers in group 2 (effective caregivers) and group 3 (stigmatized caregivers). Stigmatized caregivers were distinguished from the other 2 groups by reporting significantly higher levels of perceived stigma than either of them. Interestingly, although the caregivers in the stigmatized group reported higher levels of burden and lower mastery than caregivers in the effective group, their use of avoidance coping and social support did not differ significantly from that of the effective group. Like the caregivers in the effective group, the stigmatized caregivers reported lower use of avoidance coping and greater subjective social support than caregivers in the burdened group.

Table 2 presents descriptive data and comparisons between caregivers in the 3 clusters on caregiver and patient demographics and on patient clinical characteristics for spousal and

parental caregivers. Caregivers and patients in the burdened group were more frequently non-white, and patients in the burdened cluster were more frequently unemployed and met criteria for a major affective episode more frequently than patients in the effective and stigmatized groups. Although the sample included caregivers with other relationships to the patient (13 daughters, 5 sons, 17 sisters, 7 brothers, 5 other family members, 28 friends/neighbors, 20 significant others, 14 nonfamily members, and 1 legal guardian/ foster parent), the number of caregivers in these groups was too small to meet minimum sample size requirements for statistical comparison between the 3 clusters.

Stability of Cluster Membership

Comparing cluster membership over time, 66.5% of caregivers remained in their assigned cluster 6 months after baseline, whereas 64.4% remained in their assigned cluster a year after baseline.

Multivariate Models

A significant effect for group was observed for each of the 5 health outcomes. The effective and stigmatized groups both reported fewer depressive symptoms, sleep problems, better general health and health practices, and lower service use than the burdened group. When compared with the effective group, the stigmatized group reported poorer health practices. Among covariates, caregiver age was significantly associated with health outcomes: older caregivers reported a higher number of sleep problems, poorer general health, and fewer depressive symptoms, than younger caregivers (Table 3). Not surprisingly, caregivers whose relatives with bipolar disorder met criterion for a major affective episode reported poorer general health ($p < 0.01$); poorer general health was also associated with patient unemployment. As a whole, the sample reported fewer sleep problems, lower depression, and better health practices over time; however, these effects were limited to the first 6 months of study (Table 3). There were no significant group by time interactions.

DISCUSSION

This study used cluster analysis to identify caregivers with differing stress appraisal and coping profiles, and evaluated group differences in health and mental health outcomes over time. Caregiving stress was defined both in relation to the problem behaviors exhibited by the patient in interaction with the caregiver and in relation to caregiver experiences of devaluation and discrimination from the general public directed toward families of people with mental illness. Our findings showed that the caregivers who reported the highest levels of stress in relation to illness symptoms and associated problem behaviors employed less adaptive coping strategies than caregivers who reporting relatively low levels of caregiving strain and caregivers who reported high levels of stigma-related stress. Moreover, caregivers in the high “problem behaviors” burden group had poorer subjective health and mental health outcomes over time than both caregivers who experienced strain in relation to perceived stigma and caregivers reporting little caregiving strain overall. Although caregivers who reported the highest strain in relation to mental illness stigma had better health outcomes than those reporting the highest strain in relation to problem behaviors, the health outcomes of the former group (i.e., stigmatized caregivers) fell somewhat short of

those observed for effective caregivers in the area of health behavior: stigmatized caregivers practiced less adequate self-care than effective caregivers. In addition, whereas stigmatized caregivers used equally adaptive coping strategies as the effective caregivers, they perceived themselves to have lower levels of mastery than the effective caregivers. These findings were independent of the patient's clinical or functional status.

The finding that caregivers who appraise higher levels of caregiving stress in relation to the patient's problem behaviors employ less effective coping strategies, report more frequent health and mental health problems and use services more often is consistent with the results of studies of caregiving in other disorders cited in the introduction. To our knowledge, however, this is the first study to report adverse health effects in relation to caregiving strain for bipolar disorder. Although prior studies have evaluated the impact of 1 or more individual stress and/or coping measures on health outcomes, the methods employed here identified a subgroup of caregivers whose stress appraisal and coping responses made them especially vulnerable to the adverse health and mental health effects associated with caregiving strain. Because the course of bipolar disorder is cyclical, we would expect changes in caregiver burden, distress, and coping efficacy in relation to variations in patient clinical status over time. From this perspective, the finding that approximately two thirds of caregivers remain in the burdened and other clusters over 12 months of study is striking and suggests that the majority of caregivers have a stable adaptation to caregiving. Moreover, the fact that group membership continued to be associated with health and mental health outcomes over time despite changes in group membership suggests that the stress and coping measures selected as criterion variables have prognostic utility in defining caregiving adaptation as it relates to health outcomes. The results of the cluster analysis should be replicated in a different sample of caregivers and used to develop a screening measure to identify at-risk caregivers and facilitate allocation of services in a clinic setting.

Although group membership reliably predicted level of caregiver health outcome variables over time, it did not predict changes in health outcomes. The follow-up period in this study was relatively brief, and it may be that changes in health status in relation to caregiving adaptation take place over a longer time frame. Another important limitation of this study is the use of self-report indices of health and mental health. Future studies of caregiving stress and health should follow caregivers for a longer time interval and use more objective measures such as physician or nurse assessment of physical health and structured psychiatric diagnostic interviews. In addition, because the psychiatric status and service use history of the caregivers are unknown, and because bipolar disorder is a familial illness, we cannot rule out the possibility that this most burdened group of caregivers are also those with the greatest history of affective illness. Future studies of caregiving for patients with mood disorders should include diagnostic measures to further refine the parameters identifying those caregivers at highest risk for the adverse health and mental health effects of caregiving. Our longitudinal age effects on health outcomes suggest that as the cohort of caregivers caring for their spouses, parents, and adult children with bipolar disorder age, the emotional and physical, and economic toll of caregiving tend to increase. The fact that affective illness is genetically transmitted, compounding the potential risks of caregiving in an already high risk population, in our view underscores the need for additional research on interventions designed to reduce these effects. Finally, because the majority of caregivers

were spouses or parents, and the sample included only very small numbers of adult children or siblings, our findings cannot be generalized to other disorders such as dementia; future studies might profitably adopt a similar strategy to ours in defining subgroups of caregivers of patients with dementia.

Stigmatized Caregivers

Theories of mental illness stigma have suggested that individuals react to the devaluing attitudes held by society either by internalizing them, leading to a decrement in self-esteem (Corrigan, 2004; Link et al., 2001), or alternatively, with “righteous anger” (Corrigan, 2004). Although caregivers who internalize the devaluing views of society might be anticipated to experience a decrement in self-esteem, less adaptive coping, and inadequate health practices, a response of “righteous anger” may motivate them to take constructive actions to reduce the adverse impact of stigma, such as participating in consumer advocacy programs which promote empowerment and social support, and have been associated with improved caregiver health outcomes (Dixon et al., 2004).

Prior studies of perceived stigma among caregivers have found that higher levels of mental illness stigma were associated with less adaptive coping and/or mental health outcomes, specifically with less use of social support (Fadden et al., 1987; Rose et al., 2002; Stengler-Wenzke et al., 2004) and increased report of depressive symptoms (Mickelson, 2001). Interestingly, in this study caregivers reporting the highest strain in relation to stigma showed both resilience, in that they exhibited more adaptive coping compared with the “problem behaviors” burdened group, but also showed signs of internalizing the devaluing views of society, in their lowered estimation of their own mastery relative to the effective group. Similarly, although they had improved health outcomes relative to the problem behaviors burdened group, they exercised poorer self-care and used more services than the effective group. Although we did not measure empowerment or consumer advocacy, it is possible that potential adverse effects of stigma on coping and health were “buffered” by a response of righteous anger on the part of some caregivers. Alternatively, the resilience demonstrated by our group of stigmatized caregivers may reflect the composition of the patient and/or caregiver study samples. In contrast to most prior studies of stigma, our study sample was comprised primarily of patients whose illness had stabilized: only 40.0% met criteria for an affective episode at baseline, 15.5% at 6 months, and 14.9% at 12 months. Link et al. (1997) have suggested that the impact of stigma is most observable when the illness is most acute and may in fact decrease as the illness improves and active symptoms no longer identify the individual as “different.” Thus, the relative stability of our patient sample may have attenuated adverse effects of stigma on caregiver coping and health potentially observable at a more acute phase of illness.

CONCLUSIONS

In summary, this study used factor and cluster analysis to identify 3 groups of caregivers with different patterns of stress appraisal, coping and health outcomes over time, controlling for patient clinical and functional status. Effective caregivers had low stress appraisal, exercised adaptive coping, practiced good health behavior, and had superior health

outcomes. Burdened caregivers had high stress appraisal related to the patient's problem behavior, practiced less adaptive coping and self-care, and had the poorest health outcomes. A third group with high stress appraisal related to perceived stigma (i.e., stigmatized caregivers) had low mastery and inadequate self-care but used effective coping and had good health outcomes. The results of this study can be used to prospectively identify caregivers at risk for adverse health outcomes associated with caregiving and target them for a prevention-focused intervention. A number of peer and clinician—administered interventions for family caregivers of patients with bipolar and other serious mental disorders [e.g., The Family to Family program offered by the National Alliance for the mentally ill (Dixon et al., 2004); Multiple Family Group (McFarlane, 1983), Family Psychoeducation for bipolar disorder (Miklowitz, et al., 2000)] and other family interventions with demonstrated clinical efficacy, include material on caregiver self-care, and might be offered to caregivers with high burden profiles.

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TABLE 1

Comparison Between Cluster Group Members on Criterion Variables

	Cluster 1 Burdened Caregivers (N = 174)	Cluster 2 Effective Caregivers (N = 102)	Cluster 3 Stigmatized Caregivers (N = 113)	F	p
Burden	51.28 ± 25.16 ^a	22.12 ± 14.79 ^b	31.16 ± 21.63 ^c	68.99	0.000
Mastery	18.11 ± 2.52 ^a	21.28 ± 2.65 ^b	20.41 ± 2.62 ^c	47.97	0.000
Perceived stigma	17.19 ± 2.30 ^a	14.58 ± 1.61 ^b	19.28 ± 1.78 ^c	224.56	0.000
Avoidance coping	15.98 ± 3.90 ^a	9.94 ± 3.26 ^b	10.61 ± 2.85 ^b	114.84	0.000
Subjective support	17.36 ± 2.81 ^a	20.07 ± 1.23 ^b	20.00 ± 1.24 ^b	85.20	0.000

Groups with different superscripts differ at $p < 0.02$ or less.

TABLE 2
 Comparisons Between Caregiver Cluster Groups on Patient and Caregiver Sociodemographics and Patient Clinical Characteristics

	Burdened Caregivers	Effective Caregivers	Stigmatized Caregivers	χ^2/F	<i>p</i>
Caregiver demographics					
Age	46.67 ± 11.93	50.22 ± 13.82	48.74 ± 11.18	2.52	0.082
Gender (female)	67.6% (69)	61.3% (106)	67.6% (75)	1.68	0.432
Marital status (married)	72.2% (70)	72.7% (125)	75.9% (82)	0.48	0.789
Race (white)	79.4% (77) ^a	93.0% (159) ^b	88.8% (95)	11.09	0.004
Education	14.28 ± 2.24	14.57 ± 2.20	14.79 ± 2.03	1.48	0.229
Employed	72.2% (70)	69.0% (118)	77.8% (84)	2.55	0.280
Relationship to patient					
Parent	34.0% (33)	34.9% (60)	32.4% (35)	0.18	0.913
Spouse	44.3% (43)	36.0% (62)	37.0% (40)	1.93	0.381
Patient demographics					
Age	40.71 ± 13.69	40.45 ± 14.59	38.87 ± 12.00	0.60	0.550
Gender (female)	51.0% (52)	53.5% (92)	60.7% (68)	2.30	0.317
Marital status (married)	49.5% (48)	42.1% (72)	42.1% (45)	1.60	0.450
Race (white)	81.3% (78) ^a	91.8% (157) ^b	88.8% (95)	6.65	0.036
Education	13.59 ± 2.43	14.16 ± 2.37	14.24 ± 2.31	2.42	0.091
Employed	33.3% (32) ^a	49.1% (83) ^b	50.5% (54) ^b	7.69	0.021
Patient clinical characteristics					
Age at first treatment	26.15 ± 11.47	28.16 ± 12.58	24.91 ± 11.77	2.46	0.087
Ever hospitalized (y/n)	74.3% (75)	64.9% (113)	73.0% (81)	3.42	0.181
Age at first hospitalization	29.04 ± 11.73	28.33 ± 11.25	27.11 ± 9.79	0.56	0.571
GAF score	60.72 ± 14.89	49.86 ± 12.23	58.82 ± 12.08	0.20	0.818
Currently in episode	50.5% (51) ^a	32.4% (56) ^b	39.6% (44)	8.80	0.012

Employment includes part-time employment.
 Groups with different superscripts differ at $p < 0.02$ or less.
 GAF indicates global assessment of functioning.

TABLE 3

Longitudinal Random Regressions for Health Outcomes by Caregiver Clusters

	CESD		Self-rated Health		HRB		Service Utilization		Sleep Problems	
	Est.	p	Est.	p	Est.	p	Est.	p	Est.	p
Covariates										
Caregiver age	-0.11	0.00	-0.01	0.04	-0.02	0.06	0.05	0.28	-0.11	0.00
Caregiver white	0.75	0.55	0.05	0.61	-0.51	0.11	0.21	0.28	2.39	0.05
Clinical status	1.47	0.07	-0.18	0.01	0.26	0.19	-0.03	0.82	0.49	0.53
Patient employed	-0.93	0.25	0.14	0.03	-0.11	0.58	-0.02	0.85	-0.33	0.67
Time										
Baseline	1.26	0.02	0.03	0.46	0.54	0.00	0.04	0.69	1.93	0.00
6 mo	0.85	0.12	-0.06	0.13	0.08	0.60	-0.05	0.60	0.85	0.12
12 mo	0.00	—	0.00	—	0.00	—	0.00	—	0.00	—
Cluster (comparator = burdened) ^a	61.46	0.00	12.52	0.00	29.97	0.00	5.12	0.01	11.81	0.00
Effective	-10.53	0.00	0.39	0.00	-1.92	0.00	-0.48	0.00	-4.63	0.00
Stigmatized	-9.76	0.00	0.32	0.00	-1.38	0.00	-0.29	0.08	-3.56	0.00
Burdened	0.00	—	0.00	—	0.00	—	0.00	—	0.00	—
Intercept	20.57	0.00	3.06	0.00	10.04	0.00	1.25	0.00	11.96	0.00
Cluster (comparator = effective) ^b	61.46	0.00	12.52	0.00	29.97	0.00	5.12	0.01	11.81	0.00
Burdened	10.53	0.00	-0.39	0.00	1.92	0.00	0.48	0.00	4.63	0.00
Stigmatized	0.77	0.41	-0.07	0.36	0.53	0.02	0.19	0.17	1.06	0.24
Effective	0.00	—	0.00	—	0.00	—	0.00	—	0.00	—
Intercept	10.04	0.00	3.45	0.00	8.12	0.00	0.77	0.02	7.33	0.00

^{a, b} F values and probability for overall effect of cluster are given on the first line; parameter estimates and p values for individual clusters are given below. Values in bold represent parameter estimates a p values significant at p < .05.