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ORIGINAL PAPER

Personality factors and mental health outcome in caregivers of first hospitalized schizophrenic and depressed patients: 2-year follow-up results

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Abstract While neuroticism has been intensely investigated in caregivers of patients with serious somatic disorders, studies in caregivers of patients with mental illness are lacking. Additionally, most studies are cross-sectional not allowing conclusions about long-term effects of personality factors. The present study examines the impact of personality factors on the course of subjective burden and psychological well-being by a mediational model in a sample of caregivers of first hospitalized patients with schizophrenia or depression within a 2-year follow-up period. At baseline, 83 caregivers could be enrolled in the study, the drop-out rate was about 23% at 2-year follow-up. Personality factors were assessed by the German version of the NEO-FFI (Borstenau and Costa 1993) only at baseline. At each follow-up, subjective burden was assessed by the FBQ (Möller-Leimkühler acc. to Pai and Kapur (Brit J Psychiat 138:332–335, 1981)), and psychological well-being by the SCL-90 R (Derogatis in SCL-90-R, administration, scoring and procedures. Manual for the r(evised) version. John Hopkins University School of Medicine, Baltimore, 1977). Among the personality factors, neuroticism turned out to be the most relevant predictor of subjective burden and self-rated symptoms, showing direct as well as indirect effects. The direct effects on caregivers' mental health were mediated to a considerable amount by subjective burden. The mediational model was stable across time and even revealed increasing indirect effects of neuroticism. Caregivers' neuroticism as a dispositional trait plays a crucial role in the course of the stress process. As neuroticism is associated with perceptual distortion, the latter should be targeted by long-term family interventions in order to reduce subjective burden and enhance mental health of the caregivers.

Keywords Neuroticism · Caregiver burden · Mental health · Follow-up · Mediator model

Introduction

Burden and coping of relatives caring for a family member with a serious mental or somatic disorder show a high degree of variability, which is mainly independent of the patients' level of impairment. Numerous studies indicate that it is not the 'objective' load from the patient that directly determines the level of caregivers' burden, but the subjective perception of the situation by the carer and his subsequent coping. Interestingly, studies that report no or only a weak relationship between the patients' functional impairment and caregivers' burden are based on observal ratings either of the patients themselves or of their therapists. In contrast, studies reporting strong associations between the patients' behaviour problems and the caregivers' well-being have typically relied on the caregivers' assessment, thus indicating the high impact of the caregivers' own subjective interpretation of the stress process [3]. In conclusion, individual characteristics of the caregiver himself are more important in predicting his level of burden and well-being [10, 11, 22–25, 30]. One of the most extensively studied characteristics of the caregivers has been their expressed emotion (EE). EE has been shown to be a strong predictor of the patients' relapse in psychosis and mood disorders [1, 5, 31], and significant and consistent associations with caregivers' burden had been observed [25, 32, 37]. From a common point of view, the

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emotional status of the caregivers depends highly on the level of the patients' psychopathology, but data also point to a trait component of EE, as EE seems to be rather stable in the longer term due to its association with specific caregiver traits such as locus of control [2, 15, 25].

Other predictors of caregiver burden might be personality factors. The impact of personality factors in shaping subjective assessment and coping strategies is well established in the general mental health literature [e.g. 26, 35]. In caregiver research, most of the respective studies had focussed on caregivers of patients with dementia, cancer or other chronic disorders, less on caregivers of the mentally ill. In sum, these studies suggest more similarities than differences in the context of personality and coping across the diagnoses. For example, Hooker et al. [12] found among caregivers of spouses with dementia that personality traits explained 60% of the variance in emotion-focused coping and 30% in problem-focused coping. In another study, the authors could identify significant direct and indirect effects on their physical health [13]. Similar findings were reported by Patrick and Hayden [28], de Jong et al. [8] as well as by Carter and Acton [7], and Kim et al. [19]. Findings consistently support a substantial association between caregivers' neuroticism, their level of burden and emotion-focused coping strategies.

Although the link between personality and mental health has been intensely studied, most studies have a cross-sectional design and thereby limit the scope of possible conclusions on the impact of personality factors, especially neuroticism. As depression levels may predict neuroticism levels, and subjective burden is strongly related to depression, the causal effects of traits, states and outcome cannot be identified. Therefore, longitudinal designs are needed to find out, whether personality factors as dispositional traits have an effect on caregivers' outcome. There are only a few longitudinal studies in dementia, which suggest that neuroticism is a risk factor for increased caregiver burden and depression across time [14, 18, 25, 29].

The aim of the present study is to investigate the relationship between personality factors, subjective burden and psychological well-being of the caregivers of schizophrenic and depressed patients within a follow-up period of 2 years. According to Lazarus and Folkman [20], subjective burden is defined as the assessment of the situation resp. the indirect evaluation of the coping resources. The level of mental well-being refers to the consequences of caring.

The following hypotheses will be tested: (1) Personality factors have direct effects on the mental well-being of the caregivers, (2) personality factors have additionally indirect effects on mental well-being due to their association with subjective burden, and (3) these associations will be stable across a 2-year follow-up period.

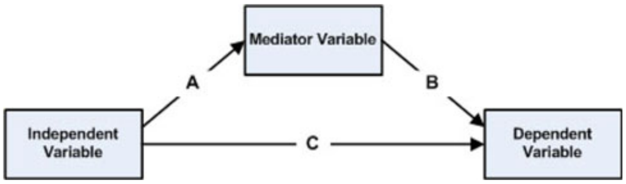

Fig. 1 Mediator model

These associations represent a mediator model with personality factors as the independent variable, subjective burden as the mediator variable, and psychological well-being as the dependent variable as is shown in the Fig. 1.

Rather than assuming a direct causal relationship between the independent variable (personality factors) and the dependent variable (psychological well-being), a mediational model hypothesizes that the independent variable causes the mediator variable (subjective burden), which in turn causes the dependent variable. The mediator variable, then, serves to clarify the nature of the relationship between the independent and dependent variables, thus representing the mechanism that underlies the observed relationship between two variables [21]. A mediator effect can be identified, if the effect of the independent on the dependent variable is diminished or reduced.

The present study is part of the Munich 5-year follow-up study on relatives of first hospitalized patients with schizophrenia or depression using a comprehensive stress model, which is described elsewhere [23–25].

Method

Participants

In-patients first hospitalized for a schizophrenic or depressive episode were recruited within the German Research Networks of Schizophrenia or Depression in the years 1999–2003. Patients who lived with a relative or had a facial contact of at least 15 h per week were informed of the caregiver study and asked to name the person to whom they have the closest contact. After getting the informed consent from the patient, the relative was contacted and, if he/she agreed to participate into the study, he/she was interviewed by the first author about 3 weeks after first hospitalization of the patient. The index-interview was audiotaped, and a protocol was written by the author adapting to the wording of the caregiver. Numerous standardized questionnaires were completed by the caregivers at home.

At baseline 85 caregivers participated, and full standardized data files of 83 caregivers were available

(48 relatives of depressed patients, 35 relatives of schizophrenic patients).

Of the 85 key relatives, 73 (90.41%) could be reassessed at 1-year follow-up (45 relatives of the depressed patients, 25 relatives of the schizophrenic patients). Of these, 3 relatives participated in the interview but did not complete the questionnaires. As a result, complete data files of 70 key relatives were available at 1-year follow-up. At 2-year follow-up, 64 relatives completed the questionnaires.

Measures

Personality was measured by the German version of the NEO Five-Factor Inventory (NEO-FFI) [4], short form, a widely used instrument. It is a self-administered questionnaire consisting of 60 items rated on a 5-point response scale (‘strongly disagree’ to ‘strongly agree’). It assesses five independent personality traits: neuroticism, extraversion, openness, agreeableness, and conscientiousness. Due to the assumption that these personality dimensions are stable traits they were assessed only at baseline.

Subjective burden was measured at each follow-up with the Family Burden Questionnaire (FBQ), which was adapted by the first author from the semi-structural interview of Pai and Kapur [27]. This instrument is also a self-rating scale and is applicable to relatives of schizophrenic as well as depressive patients. With regard to several life domains (daily living, family atmosphere, leisure, financial aspects and well-being), objective and subjective aspects of burden are assessed with 29 items for the last 3 months. Objective burden is defined as observable changes in routine arrangements and is bipolarly assessed by the relative (e.g. “Does his/her behaviour disturb daily routine?” The answer is yes or no). Subjective burden refers to each item of objective burden with the question, how burdensome this is for the relative. The answer consists of a three-point scale: not at all/moderate/very burdensome. While Pai and Kapur offer only one global score of subjective burden, the author has constructed several scores for objective and subjective burden, once with regard to each life domain and once with regard to a global measure of the objective and subjective dimension of burden. To make the scores more perceptual, the quotients (sums of item values are divided through number of items) are transferred to percentage by multiplication with 100. In the present study, only the global score of subjective burden is used. Reliability test ($n = 83$) for the global percentage of objective burden resulted in alpha = 0.83, for the global percentage of subjective burden in alpha = 0.88, and for the entire scale alpha was 0.92.

Psychological well-being of the caregivers was assessed at each follow-up by the self-administered Symptom-Checklist-90-R (SCL-90) [9]. It evaluates a broad range of current psychological problems and symptoms of psychopathology consisting of 90 items and yielding nine scores along primary symptom dimensions (e.g. somatization, obsessive–compulsive, interpersonal sensitivity, depression, anxiety, hostility) and three scores among global distress indices. In the present study, only the GSI, the global severity index referring to all 90 items, is used.

Statistical analysis

Group differences were tested by Student’s *t*-test. Changes in levels of burden in each dimension were calculated by using the Friedman-test for dependent samples, and in case of significance by the Wilcoxon-test for post hoc pairwise comparisons. With respect to the mediational model of personality factors, subjective burden and psychological well-being, the direct effects between these three variables were primarily calculated by bivariate correlation. In the case of significant correlations between the personality factors and the two other variables, the mediator model was tested by three multivariate regression analyses for each personality factor. The postulated indirect effect of personality factors on psychological well-being was evaluated by multiplication of the direct effects between the independent and mediating variable as well as between the mediating and dependent variable. For the assessment of the significance of the indirect effect, the standard error (SE) was assessed by the method of Sobel [34], followed by a subsequent *t*-test. According to Sobel, the *t* value is defined as the quotient of the indirect effect of the mediator variable on the dependent variable and its standard error (Table 2).

Results

The present sample includes predominantly spouses of the patients with a balanced rate of male and female participants (Table 1). The mean age is 48.3 years (SD 17.9) and is mostly identical in male and female participants. The percentage of caregivers of depressive patients predominates at each assessment, but without age-related differences compared with the caregivers of the schizophrenic patients. Similarly, there are no significant differences in personality factors among the caregivers of schizophrenic and depressed patients, although the caregivers of the schizophrenic patients tend to report higher levels of neuroticism. Inspite of unavoidable attrition in

Table 1 Characteristics of the follow-up sample

	Baseline (*n* = 83)	1-year follow-up (*n* = 70)	2-year follow-up (*n* = 64)
Spouses	75.5%	75.4%	81.0%
Parents	22.9%	24.6%	17.5%
Males	48.5%	51.4%	52.4%
Mean age	48.3 ± 17.9	49.2 ± 10.9	48.3 ± 17.9
Caregivers of depressed patients	64.9%	66.0%	65.6%
Caregivers of schizophrenic patients	35.1%	34.0%	34.4%
Full-time job	44.6%	39.2%	33.2%

Table 3 Bivariate correlations (Rho) between personality factors, subjective burden and psychological well-being

Personality factor	Baseline		1-year follow-up		2-year follow-up	
	SB	GSI	SB	GSI	SB	GSI
Neuroticism						
Rho	0.28	0.55	0.55	0.68	0.65	0.72
P	**0.24**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Extraversion						
Rho	−0.05	−0.24	−0.19	−0.40	−0.29	−0.28
P	0.67	0.06	0.16	**0.02**	**0.05**	**0.04**
Openness						
Rho	−0.10	0.03	−0.03	−0.17	−0.18	−0.21
P	0.43	0.83	0.81	0.21	0.20	0.13
Agreeableness						
Rho	−0.15	−0.26	−0.33	−0.60	−0.41	−0.41
P	0.25	**0.04**	**0.01**	**0.00**	**0.03**	**0.03**
Conscientiousness						
Rho	−0.03	−0.16	−0.14	−0.30	−0.15	−0.29
P	0.83	0.20	0.92	0.21	0.30	0.35

Significant correlations are printed in bold

SB subjective burden, *GSI* global symptom index

follow-up samples due to nonresponse, the structure of this sample remains rather stable (Table 1).

Changes of subjective burden and psychological well-beings

Over the 2-year-follow-up period, a significant reduction in subjective burden can be observed mainly in the first year after the patients' first admission. Similarly, their psychological well-being tends to improve, but the mean scores continue to differ significantly from the respective norm values (0.31 ± 0.31), indicating a relatively persistent elevated level of self-rated symptoms (Table 2).

With respect to diagnosis, the caregivers of the schizophrenic patients tend to report higher levels of subjective burden than the caregivers of the depressed patient at each point of assessment (29 ± 20% vs. 19 ± 14% at baseline, 18 ± 23% vs. 12 ± 15% at 1-year follow-up, and 16 ± 17% vs. 11 ± 18% at 2-year follow-up). However, none of these differences reach the level of significance, probably due to the small size of the subsample of schizophrenic patients. Similarly, the levels of self-rated symptoms (SCL-90 R, GSI) tend to differ considerably but not significantly at the two follow-ups, with relatives of the schizophrenic patients having again the higher scores.

Mediator models

Among the personality factors, only neuroticism complies with the requirements of a mediator analysis at each point of assessment, because it significantly correlates with both, subjective burden and psychological well-being (Table 3).

Agreeableness complies with the requirements at 1- and 2-year follow-up, and extraversion only at 2-year follow-up. Consequently, six mediator models had to be tested, selective results are documented in Table 4.

Mediator effects of subjective burden are confirmed with regard to neuroticism and psychological well-being at each point of assessment, and additionally for the personality factor agreeableness at 2-year follow-up, but without significance. Here, the correlations are negative, because agreeableness obviously reduces feelings of subjective burden. For agreeableness at 1-year follow-up, Beta (−0.57) is only slightly lower than the bivariate correlation (−0.60), indicating that the positive effect of agreeableness on psychological well-being is hardly influenced by the intervening variable subjective burden. At 2-year follow-up, the personality factor extraversion though complying to the basic requirements for mediation is not suited for further calculations, because no significant Beta resulted in

Table 2 Changes in mean scores of caregivers' subjective burden and psychological well-being (Friedman- and Wilcoxon-test)

	Baseline	1-year follow-up	2-year follow-up	*P* baseline vs. 1-year	*P* baseline vs. 2-year	*P* 1-year vs. 2-year
FBQ-SB (0–100)	23 ± 18	14 ± 18	14 ± 18	0.000	0.000	n.s.
SCL-GSI (0–1)	0.53 ± 0.53	0.43 ± 0.44	0.47 ± 0.71	0.006	0.002	n.s.

FBQ-SB global score of subjective burden (Family Burden Questionnaire), *SCL-GSI* global symptom index (Symptom-Checklist)

Table 4 Selected results of the mediator models at baseline, 1-year- and 2-year-follow-up

Point of assessment	Significant PF	PF/GSI Rho	PF/GSI standard Beta	PF/SB/GSI indirect effect Beta	PF/SB/GSI indirect effect SE	*t*	*P*
Baseline	Neuroticism	0.55	0.42	0.15	0.007	1.43	<0.05
1-year follow-up	Neuroticism	0.68	0.41	0.28	0.14	1.14	<0.05
	Agreeableness	−0.60	−0.57	–	–	–	–
2-year follow-up	Neuroticism	0.72	0.31	0.41	0.20	1.35	<0.05
	Agreeableness	−0.41	−0.29	−0.33	0.17	3.00	n.s.
	Extraversion	−0.28	–	–	–	–	–

PF personality factor, *GSI* global symptom index, *SB* subjective burden, *SE* standard error

the regression analysis. As can be seen in Table 4, there is a considerable difference between the bivariate correlations and the regression coefficient Beta, especially for neuroticism over time, indicating significant indirect effects of neuroticism on psychological well-being. Furthermore, the indirect effect of neuroticism increases over time: At baseline, 26% of the total effect of neuroticism (sum of the direct and indirect effect), at 1-year follow-up 41%, and at 2-year follow-up 57% is due to the indirect effect of neuroticism.

Discussion

The present 2-year follow-up study proves that the psychological well-being of caregivers of first hospitalized schizophrenic and depressed patients is significantly reduced compared to norm values, although it improves 1 year after first admission. Symptoms mainly refer to depression and somatization. Patients' diagnosis does not significantly influence the level of subjective burden and well-being, although caregivers of schizophrenic patients report higher levels of subjective burden and psychological symptoms over time. In the present study, caregivers of the schizophrenic patients were predominantly not parents, but spouses (24% spouses, 15% mothers), who did not differ in their mean age from the caregivers of the depressed patients. Due to this, their higher subjective burden can be explained neither by higher age nor by genetic similarities. One possible explanation points to the different course of schizophrenia and depression. It is well known, that burden and the acuity of symptoms are corresponding. While the acuity of affective disorders is diminishing in the course of time and normally tends to zero after a period of 6–12 months, schizophrenic disorders tend to persist. Personality factors do not differ significantly between the caregiver groups.

The main purpose of the present study was to identify the underlying mechanism of the relationship between personality factors and psychological well-being of the caregivers, assuming that subjective burden would be the mediator, thus revealing direct and indirect effects of personality factors.

Among the personality factors, neuroticism appears to be the most relevant dimension in this context. At each point of assessment, significant direct and indirect effects could be detected, whereat the indirect effects even increased from 21 to 57% within the 2 years. At 1-year follow-up, direct effects of the personality factor agreeableness on psychological well-being could be observed, but indirect effects were not consistent and significant. Data indicate that the three hypotheses could be supported only for neuroticism. That means that neuroticism is the most powerful personality dimension affecting psychological well-being of the caregivers directly and indirectly. This finding is consistent with a number of studies, identifying neuroticism as a relevant predictor of stress perception and mental health of caregivers of patients with dementia, cancer or other serious chronic disorders [6, 8, 13, 19, 20, 28, 33]. The kind of chronic conditions does not obviously affect caregivers' own appraisal of the associated burden.

Indirect effects of neuroticism are infrequently examined. Existing data suggest that a substantial part of the impact of neuroticism is due to levels of subjective burden. For example, Hooker et al. [13] found significant indirect effects of neuroticism on the mental health of caregivers of patients with dementia, mediated by perceived stress with a Beta value of 0.42, which is comparable to that of the present study at 2-year follow-up (Beta = 0.41).

The present study is one of the very few studies investigating the causal mechanisms of personality factors in a longitudinal design. As mentioned before, the impact of neuroticism is not only stable over time, but even increases with the duration of the family member's mental illness, with the consequence that the impact of subjective burden more than doubles.

In comparison with many other factors, personality factors are able to explain a substantial part of psychological impairment. Hooker et al. [13] report an explained variance of even 80%. In the present study, the explained variance is at baseline and 1-year follow-up 40% and increases to 46% in the second year. The mediator models with agreeableness as predictor reveal 57% explained variance at 1-year follow-up and 51% at 2-year follow-up, but mainly due to the direct effects.

To conclude from the present data, neuroticism as a stable disposition of a person plays a crucial role in the stress process. The level of neuroticism as an antecedent personal trait already designates how stressful a live event and its consequences are perceived. The higher the level of neuroticism, the higher the subjective burden and the higher the level of psychological symptoms. Psychological symptoms, in turn, aggravate emotional instability, thus producing a circulus vitiosus. This may explain, why the impact of subjective burden is increasing over time. Furthermore, one could expect that the psychological well-being of caregivers with high levels of neuroticism is already impaired before the family member's mental illness, and due to the subsequent indirect effects it is getting even worser in the course of time. Even though caregivers' psychological well-being improves in the first year after hospitalization, the underlying mechanism remains the same. Data point out that subjective burden or perceived stress is a stable mediator of the relationship between neuroticism and psychological well-being, thus supporting the transactional character of the stress process as has been described by Lazarus and Folkman [20].

The personality factor agreeableness, an antagonist of neuroticism, appeared as a second relevant predictor, although not reaching significance. Caregivers with high levels of agreeableness are empathetic, warm-hearted, respectful, helpful, indulgent and trustful thereby having socially highly acceptable attitudes. The relationship between agreeableness and psychological well-being is inverse and direct in the first year, also indirect in the second year without reaching significance. Nevertheless, agreeableness seems to be a relevant antagonist to neuroticism enhancing psychological well-being of the caregiver through more listening and responding to the patient as well as more tolerant and respectful interactions and less negative reactions.

The present study has several limitations. The first limitation is due to the size and structure of the caregiver sample, which is not identical with the whole population of caregivers and therefore cannot claim representativeness of the results. Basically, it is difficult to reach representativeness, because the category 'first hospitalization' may hide a variety of duration of prodromal states, which could have previously and differently influenced caregivers' sense of burden. In many of the existing caregiver studies, especially those with a longitudinal design, the sample size seldom exceeds $n = 100$, and the attrition rate additionally contributes to reduce the sample size and may produce biased results. A bias due to drop-out rates can widely be ruled out for the present study. In fact, sampling theory says that the higher the sample size, the lower the sampling error, but the sample size itself does not represent a reasonable criterion for the representativeness of a study [36]. Furthermore, caregiver samples are often selective because of convenient recruitment from caregiver organizations or groups, also not being representative for the whole population. A strength of the present study is that the sample is not selective, which is as well an aspect of representativeness. Also the fact that the findings widely correspond to the literature suggest a sufficient validity of the present data.

The second limitation is that all data are based on self-reports of the caregivers. Due to the fact that persons with high degrees of neuroticism tend to report or remember more and worse somatic and mental complaints, which cannot be clinically verified, the self-ratings of the caregivers could be biased by their level of neuroticism. However, the subjective sense of well-being and health points to complex individual realities going beyond objective health indices. For example, in a study of Idler and Kasl [17], mortality was better predicted, when objective and subjective indices were considered. Furthermore, numerous studies indicate that subjective health (even assessed as a global item) is a strong predictor for morbidity and mortality [16].

A third limitation is due to the fact that patients' variables were not included into the study. The reason for this was the consistent finding of a number of studies (see above) that in multivariate analyses, patients' variables failed to significantly affect caregivers' burden. Nevertheless, the question remains, whether caregivers' subjective burden and well-being may change—at least in part—in accordance with the patients' course of illness or whether it is independent of such external factors following an own dynamic. Apart from this question, the data of the present study suggest that the underlying mechanism of the link between neuroticism and psychological well-being is independent of the patients' clinical state and stable across time. Although the patients' psychopathology improved during the 2-year period [25], the association between caregivers' neuroticism and their self-reported symptoms becomes stronger with respect to the direct as well as indirect effects.

In spite of these limitations, the results contribute to a better understanding of caregiving and have significant implications. As individuals who are high in neuroticism are likely to assess a given stressor more negative and are likely to be more reactive in terms of psychological and somatic symptoms, intervention efforts should focus on this perceptual distortion. Due to the evidence, that this misperception is associated with less effective emotional coping strategies, a situation of constant subjective overload is produced. Of course, effective interventions have to go beyond psychoeducation because they require long-term measures. As the caregivers of the schizophrenic patients showed higher but non-significant levels of neuroticism and higher as well as more stable levels of subjective burden than the caregivers of the depressed patients, caregivers of schizophrenic patients (eminently mothers) represent a particular risk group with regard to physical and mental health problems. For identifying subgroups of caregivers with special needs, a brief assessment of personality attributes might be useful.

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