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Determinants of subjective quality of life in post acute patients with schizophrenia

■ **Abstract** Although Quality of Life (QoL) is of growing interest in schizophrenia research, little is known about putative causal determinants of this multidimensional construct. The present study explored the utility of objective indicators, psychopathological symptoms and psychosocial concepts drawn from empirical findings in community samples and the vulnerability-stress-coping model of schizophrenia for predicting general subjective QoL in post acute patients with schizophrenia. The analyses were based on cross-sectional data from 66 post acute patients with schizophrenia. The relationships between QoL and possible determinants were investigated using correlational analysis, regression analysis and structural equation techniques.

As a result no significant relationships between objective indicators and general QoL were found. The strongest significant determinants were depressive symptoms and the psychosocial concepts of negative coping, perceived social support and self-efficacy. The empirical causal modelling results indicated that depression led to a direct negative impact upon QoL, whereas the other determinants had direct negative or positive effects on depression and affected QoL indirectly. One could conclude that to enhance patients' QoL, improvements in depressive symptoms, negative coping style, social support and self-efficacy seem to be most effective.

■ **Key words** quality of life · schizophrenia · model · psychosocial concepts · coping

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Introduction

For the last 20 years, the concept of Quality of Life (QoL) has become increasingly relevant in schizophrenia research, and there is a growing amount of literature on the subject (e. g., Baker and Intagliata 1982; Lehmann 1988; Oliver 1991; Bobes 2001). However, to date no theoretical model of QoL in schizophrenia has emerged that can sufficiently integrate and explain the diversity of empirical findings and conceptual approaches such as the relationship between subjective and objective conditions (Barry 1997).

Drawing on previous findings among chronic mentally ill patients that indicate only moderate relationships between objective indicators or demographic characteristics and subjective QoL, some authors suggested that there may be a need for models of QoL that integrate psychological concepts and psychopathological syndromes that may be more central to the structure of QoL evaluations (Franklin et al. 1986; Rosenfield 1992; Mercier and King 1994; Zissi et al. 1998). For example, self-esteem, affect states (Franklin et al. 1986) and the individuals' sense of mastery (Rosenfield 1992) were identified as important correlates of subjective QoL. Others demonstrated that a positive self-concept and perceived autonomy accounted for 44 % of the variance in subjective QoL in severely mentally ill (Zissi et al. 1998), or postulated a strong causal relationship between perceived autonomy and subjective QoL (Mercier and King 1994). Given a total amount of approximately 60 % valid variance included in subjective QoL measures (Andrews and Withey 1976), the above mentioned models left a substantial portion of the whole variance unexplained.

Studies based on community samples explored the determinants of subjective QoL in a much more differentiated way than studies on mentally ill. Several psychological concepts have been found to correlate highly with indicators of subjective QoL (Costa and McCrae 1980; Dupuy 1984, Diener et al. 1985; Michalos 1985). Abbey and Andrews (1985) used an integrative approach

applying methodological techniques that were able to describe complex relationships. They demonstrated that psychological concepts and psychopathological parameters explained up to 63 % of the variance in QoL measures in a community sample. The structural equation technique results by Abbey and Andrews indicate that stress and depression have strong and negative unidirectional relationships with subjective QoL, whereas self-efficacy and social support are directly, positively and unidirectionally related with subjective QoL. Additionally, depression was unidirectionally determined by stress and external locus of control (positive sign), and by self-efficacy and social support (negative sign). Thus stress, external locus of control, self-efficacy and social support affected subjective QoL indirectly by their impact on depression.

To generate an integrative, basic model of QoL in patients with schizophrenia, we drew on the findings of Abbey and Andrews (1985) in community samples. We hypothesised perceived stress, social support, external locus of control and psychopathological indices as determining factors. Because of the substantial importance of the concept of coping in the vulnerability-stress-coping model of schizophrenic episodes (Zubin and Spring 1977; Nuechterlein and Dawson 1987), we also included coping strategies in the set of independent predictors.

Empirical studies of QoL in patients with schizophrenia have primarily investigated long-term in- and out-patients. There is evidence that QoL changes within particular stages of the illness (Priebe et al. 2000). To provide information about patients at a similar stage of the illness we only accessed post acute patients with schizophrenia, who had experienced a psychotic episode within the last 6 months.

The aims of the present study can be summarised as follows:

- to examine the utility of objective indicators, psychopathological syndromes and psychosocial concepts drawn from empirical findings in community samples and the vulnerability-stress-coping model of schizophrenic episodes in predicting the overall subjective QoL in post acute patients with schizophrenia.
- to generate an integrative, basic model for overall subjective QoL in post acute patients with schizophrenia based on selected predictors.

Quality of life was examined using the "Modular System for Quality of Life" (MSQoL; Pukrop et al. 2000), a self-report instrument consisting of a demographic module and four subjective QoL modules (a core module of seven central life areas, a partnership module, a family module and a professional occupation module). The core module comprises seven areas of QoL (47 items on a 7-point-rating scale): Physical Health (e. g., limitations to perform moderate or vigorous activities), Vitality (e. g., feeling full of life; feel relaxed and comfortable; amount of time feeling tired), Psychosocial QoL (e. g., satisfaction with relation to other people; feeling self-confident), Affective QoL (e. g., feeling under strain, stress or pressure; getting easily hurt), Material Satisfaction (e. g., with financial situation or living conditions), Leisure Time QoL (e. g., interest in hobbies at home or outdoor), General QoL (e. g., having problems in general; enjoying life). Median values for internal consistencies were 0.88 (range 0.73–0.92) in the general population and 0.83 (0.78–0.92) in patients with schizophrenia.

Objective parameters were assessed by the demographic module of the MSQoL and extracted from PCR.

Psychopathology was observer rated using the "Positive And Negative Syndrome Scale" (PANSS, Kay 1987). For further analysis we used the original two component solution for positive and negative syndromes (Kay 1987). Depression was calculated from PANSS-items G3 (guilty conscience), G6 (depressive mood) and G7 (psychomotoric retardation), anxiety was drawn from G2 (anxiety) and G4 (tension) scores of the general psychopathology subscale.

Self-efficacy and external control were measured by a modified German version of Levenson's (1974) Locus of Control Questionnaire (Krampen 1991) based on Rotter's locus of control concept (1954). This is a self-report instrument consisting of four primary scales, each including eight items. The two superordinate scales measure general self-efficacy and general externality. Internal consistencies ranged from 0.70 to 0.89.

Perceived stress and social support were recorded using a modified German version of Kanner's (1981) Daily Hassles and Daily Uplifts-Scale. This is a self-report questionnaire with 252 items on a 3-point rating scale measuring accumulating stress and support defining two scales. Test – retest correlation for an interval of one month was 0.79 for the frequency of hassles and 0.72 for the frequency of uplifts.

Coping strategies were assessed using the Stress Coping Questionnaire (Janke et al. 1985). This self-report questionnaire was based on the coping model developed by Lazarus (1966) and designed to assess coping behavior in regard to several stressors. It consists of 114 items on a 5-point-rating scale defining 3 positive coping subscales and one negative coping subscale. Coping behavior such as to belittle, to play down or to guilt defense in stressful situations was defined by the authors as devaluation (positive coping 1). Coping strategies such as diversion, relaxation and compensation were called distraction (positive coping 2). Coping strategies like control of situations and reactions, and positive self-instruction were defined as stress control (positive coping 3). Social withdrawal, resignation and self-pity defined the negative coping subscale. Internal consistencies ranged from 0.84 to 0.94.

Following a period of training in the instruments, mental state assessments were subject to a reliability check to prevent drift in accuracy of ratings across the study. Intraclass correlation coefficients were 0.87 for the positive syndrome sub-scale, 0.73 for the negative syndrome sub-scale and 0.87 for general psychopathology scale.

Method

Patients were recruited from consecutive admissions to the Department of Psychiatry and Psychotherapy of the University of Cologne between July 1999 and December 2000. They were aged between 18–64 and met criteria for an episode of a schizophrenic or related disorder (ICD-10: F 20, F 23, F 25). We only assessed patients who experienced an acute psychotic episode within the last 6 months. Assessment was carried out when patients were partly in remission from acute psychosis and were screened for participation in a psychological group intervention as part of a randomized, controlled intervention trial (Bechdolf et al. 2003).

Analysis

First, bivariate correlations (Pearson coefficients) were calculated for all QoL core dimensions and psychopathology (positive and negative symptoms, depression and anxiety scores), locus of control (self-efficacy, externality), stress, social support and coping strategies (positive and negative coping styles). Two-tailed tests were applied and results will be presented before and after a Bonferroni correction (overall $\alpha = 0.05$).

Second, those variables showing significant bivariate relationships to general QoL were entered as predictors in a stepwise multiple regression analysis to check for overlapping portions of variance. To reduce the number of calculations only general QoL was used as the dependent variable.

Third, the interrelationships of those predictors that made an independent significant contribution to QoL were analyzed using LISREL 8 (Jöreskog and Sörbom 1993). This analysis technique allows the estimation of both a measurement model (relationships between observable variables and latent factors) and a so-called causal model (relationships between latent factors). The inclusion of multiple indicators (observables) for the latent factors permits the estimation of relationships among the latent factors without the confounding effects of measurement error. Each latent factor in the model was measured with three to four observable indicators. Several models with different assumptions about the latent structure will be calculated, but only those with an adjusted goodness of fit value ≥ 0.90 will be reported. The basic model is portrayed in Fig. 1. The rectangles symbolize the observed variables, and the elliptic circles the latent constructs. The arrows symbolize inputs from the indicated sources of influence. Each arrow carries a number which indicates how much influence enters along that path. Each measure is presumed to include random (uncorrected) errors symbolized by the short arrows entering each rectangle from the perimeter of the figure.

Results

In total 66 patients could be included in the study (see Table 1 for details). They had experienced a median number of 3 hospitalizations and a mean duration of illness of 60 months. They were high educated (most of them had finished high school) and were partly remitted from acute psychotic symptoms (PANSS total score 65.7).

■ Bivariate analysis

Results of bivariate relationships are presented in Table 2. Neither objective, demographic nor clinical parameters correlated significantly with any dimension of QoL except for number of hospitalizations. Surprisingly, there was a significant positive relationship between number of hospitalizations and material satisfaction. The positive schizophrenic syndrome measured by PANSS did not correlate significantly with any dimension of QoL. A significant correlation was obtained for the negative syndrome and vitality and psychosocial QoL. Depression and anxiety were significantly correlated with all dimensions of QoL except for material satisfaction.

Many correlations could be observed for the psycho-

Table 1 Sample characteristics (n = 66)

Age, years [mean(sd)]	31.6 (9.9)
Gender [n (%)]	
Female	31 (47.0)
Male	35 (53.0)
Marital status [n (%)]	
Married, cohabitation	7 (10.6)
Living alone, divorced	59 (89.4)
Years at school [n (%)]	
≤ 10 years, other	30 (45.6)
13 years	36 (54.4)
Income [n (%)]	
> 1500 Euro	3 (4.5)
750–1500 Euro	13 (19.7)
< 750 Euro	31 (48.5)
Missing data	18 (27.3)
Duration of illness, months [mean(sd)]	60.0 (64.8)
Number of hospitalizations [median(sd)]	2.9 (3.7)
PANSS scores [mean(sd)]	
Positive syndrome	14.5 (5.4)
Negative syndrome	17.8 (7.7)
General psychopathology syndrome	33.5 (9.4)
Total score	65.7 (18.2)

logical concepts and QoL. Self perceived stress was highly negatively correlated with subjective QoL measures. There were significant correlations between social support and several dimensions of QoL. Patients who believe that their actions largely determine events and that they are maintaining the resources to overcome demands and conflicts (self-efficacy) showed higher scores in QoL measures. Patients' beliefs that events are often determined by outside forces such as luck, fate or external powers (external locus of control) were inversely correlated with four dimensions of subjective QoL. The coping strategy of devaluation was significantly correlated with psychosocial QoL. Surprisingly, no correlation could be obtained for the coping strategy of distraction and any dimension of QoL. Coping strategies, such as control of situations and reactions, and positive self-instruction (positive coping 3: stress control) correlated positively with subjective QoL (vitality and psychosocial QoL). Negative coping was inversely correlated with some dimensions of QoL including general QoL.

■ Multiple regression analysis

Results of stepwise multiple regression analysis are summarized in Table 3. All variables that showed significant bivariate relationships to general QoL were entered into the regression equation. Negative coping, depression, perceived social support and self-efficacy accounted for 60.8 % of the variance in general QoL. This set of significant predictors did not change when the analysis was repeated for patients below and above the median in positive psychotic symptoms, and for patients below the median in negative symptoms. Per-

Table 2 Bivariate correlations between QoL and objective indicators, psychopathology and psychosocial concepts (Pearson, Spearman or point-biserial coefficients)

	MSQoL quality of life core dimensions						
	Physical health	Vitality	Psychosocial QoL	Material satisfaction	Spare time	Affective QoL	General QoL
Objective indicators							
Sex							
Age							
Marital status							
Education							
Material income							
Duration of illness							
Number of hospitalizations				0.244*			
Psychopathology							
PANSS positive							
PANSS negative		−0.297*	−0.287*				
PANSS depression	−0.402**	−0.418**	−0.559**		−0.356**	−0.471**	−0.619**
PANSS anxiety	−0.294*	−0.304*	−0.388**		−0.265*	−0.390**	−0.475**
Psychosocial concepts							
DHS stress	−0.328**	−0.373**	−0.537**			−0.577**	−0.511**
DUS social support	0.312*	0.398**	0.527**	0.264*		0.251*	0.429**
LCQ self-efficacy	0.324**	0.550**	0.617**			0.506*	0.488**
LCQ general external control	−0.255*		−0.328**		−0.310*		−0.310*
SCQ positive coping 1: devaluation			0.251*				
SCQ positive coping 2: distraction							
SCQ positive coping 3: stress control		0.372**	0.339**				
SCQ negative coping	−0.451**	−0.494**	−0.608**			−0.608**	−0.634**

PANSS Positive and Negative Syndrome Scale; *DHS* Daily Hassles Scale; *DUS* Daily Uplifts Scale; *LCQ* Locus of Control Questionnaire; *SCQ* Stress Coping Questionnaire
* significant on nonadjusted $p \leq 0.05$; ** significant on nonadjusted $p \leq 0.01$; nonsignificant coefficients are not given

Table 3 Stepwise multiple regression analysis with general QOL as dependent variable; only those predictors are given that contribute significantly to general QoL (all variables that correlated significantly with general QOL were included as predictors)

	R^2	adjusted R^2	beta	F	p
SCQ negative coping	0.402	0.393	−0.318	43.07	0.000
PANSS depression	0.544	0.529	−0.374	19.50	0.000
DUS social support	0.602	0.582	0.240	9.05	0.004
LCQ self-efficacy	0.632	0.608	0.196	5.02	0.029

SCQ Stress Coping Questionnaire; *PANSS* Positive and Negative Syndrome Scale; *DUS* Daily Uplifts Scale; *LCQ* Locus of Control Questionnaire
* F- and p-values refer to the amount of variance added by the respective variable

ceived stress was the only significant predictor for subjective QoL in patients whose severity of negative symptoms was above the median. All other potential predictors (depression, anxiety, social support, self-efficacy, external locus of control, negative coping) did not make an independent contribution to QoL in patients whose severity of negative symptoms was above the median.

■ Multivariate modelling

All predictors that made an independent significant contribution to QoL were entered into linear structural equation systems (LISREL 8) to explore the interrelationships of these variables and subjective QoL. LISREL analysis requires a theoretical basis from which assumptions on the relationships between variables are derived and tested in a confirmatory way. For this purpose we used a model developed for the general population suggested by Abbey and Andrews (1985). Based on this model self-efficacy, social support, depression and negative coping were all hypothesized to affect general QoL unidirectionally. It was hypothesized that high self-efficacy and perceived social support would lead to improved perceptions of QoL. Negative coping and depression were hypothesized to have negative impact on QoL. In addition self-efficacy and social support were expected to reduce depression, while negative coping was expected to increase it. Several different models were examined both for their theoretical meaning and their relative fit with the empirical data (e. g., self-efficacy, social support, depression and negative coping or a combination of these factors were all hypothesized to affect general QoL directly and bidirectionally). However, differences in chi-square to degrees-of-freedom ratios were examined to compare alternative models (Jöreskorg and Sörbom 1993). Only the model that fitted best with the empirical data and gained an adjusted goodness of fit value ≥ 0.90 (which was the criterion defined in advance) will be described in more detail.
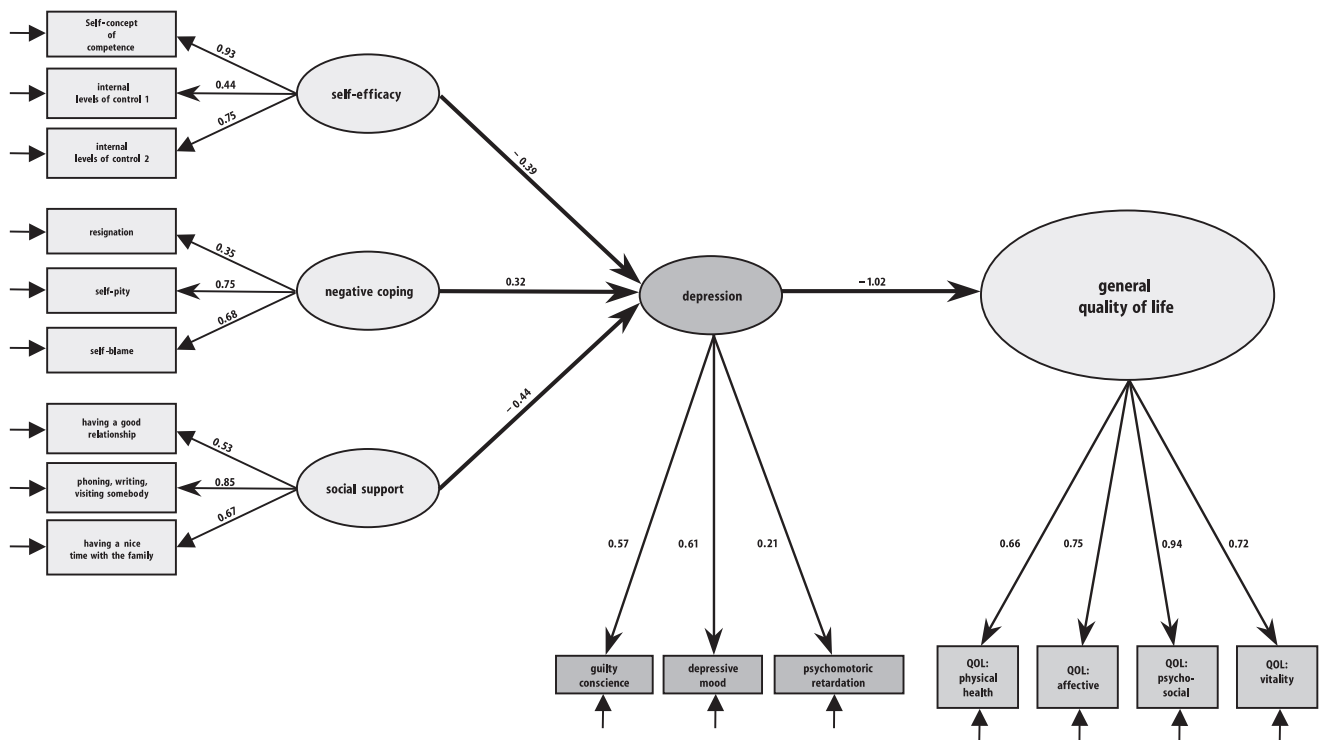
The proposed model fitted well (χ^2 with 112

Fig. 1 Structural model of general subjective QoL in post acute patients with schizophrenia

df = 362.32 (p = 0.027); goodness of fit = 0.92, adjusted goodness of fit = 0.90). As can be seen in Fig. 1, depression had substantial direct effect on QoL. Increased depression led to decreased QoL (β = –1.02). The psychosocial concepts had no substantial direct impact on QoL. However negative coping, self-efficacy and social support had significant effects on depression and an indirect impact on QoL. Social support and self-efficacy had significant negative effects on depression (β = – 0.44 and –0.40) and indirectly affected QoL positively. Negative coping affects depression positively (β = 0.32) and had a negative, indirect effect on QoL.

Discussion

The present paper proposed, for the first time, an integrative, basic model of subjective QoL, which predicted subjective QoL measures in post acute patients with schizophrenia. Our analysis indicated that psychopathological parameters and psychosocial concepts drawn from empirical findings in community samples and the vulnerability-stress-coping model of schizophrenic episodes predicted 60% of the variance of subjective QoL. The strongest determinants of QoL were depressive symptoms, negative coping strategies, perceived social support and self-efficacy. The empirical model showed that depression directly affected QoL negatively, whereas the other determinants had direct negative or positive effects on depression and affected QoL indirectly.

Thus, post acute patients with schizophrenia, who felt they had good relationships and supportive social contacts, who believed that their actions largely determine events and that they were maintaining the resources to overcome demands and conflicts did not tend to develop depressive symptoms and therefore experienced high levels of QoL. However post acute patients with schizophrenia who became resigned and encapsulated and who had low self-esteem and few problem-solving skills felt more depressive and were more likely to have low QoL-scores.

Our findings are in accord with the research evidence in a number of studies in which depression appeared as a strong predictor of overall subjective QoL in patients with schizophrenia (Lehman 1988; Sullivan et al. 1992; Mechanic et al. 1994; Browne et al. 1996, Koivumaa-Honkanen et al. 1996). In accordance with our findings, most investigations of predictors of subjective QoL in patients with schizophrenia have, on the one hand, shown weak associations between sociodemographic characteristics, objective indicators, positive and negative psychotic symptoms and subjectively reported levels of life satisfaction on the other (Lehman et al. 1988; Browne et al. 1996; Atkinson et al. 1997; Kaiser et al. 1997, Carpiniello et al. 1997).

The suggested model for subjective QoL in post acute patients with schizophrenia integrated the findings from studies of determinants of subjective QoL among the severely mentally ill, which included concepts of internal states. The concept called affect states by Fanklin and co-workers (1986) had some overlapping meaning

with our concept of depression. The concepts of self-esteem (Franklin et al. 1986), the individual's sense of mastery (Rosenfield 1992), levels of autonomy (Mercier and King 1994), self-concept and perceived autonomy (Zissi et al. 1998) are similar to our measure of self-efficacy (patients' beliefs that their actions largely determine events and that they are maintaining the resources to overcome demands and conflicts; Rotter 1966). However, coping strategies and perceptions of social support have not yet been included in models of subjective QoL. Moreover, the amount of explained variance was higher than in the above mentioned studies. Andrews and Withey (1976) estimated the amount of valid variance included in subjective QoL measures as being about 60%. Thus, the theoretical maximum that can be accounted for in subjective QoL is not 100%, whereby the predictors in the present study explain most of the portion of variance that can be expected to be explained by psychological concepts.

Results indicated that subjective QoL in community samples and in samples of post acute patients with schizophrenia are determined by almost the same variables (Abbey and Andrews 1985). In both samples psychopathological and psychosocial concepts explained about 60% of the variance in QoL measures. In both groups depression, self-efficacy and social support accounted for high proportions of the variance in overall subjective QoL. Instead of externality which was a significant predictor in the community sample, negative coping was a significant predictor for QoL in post acute patients with schizophrenia. This finding confirms the importance of the coping concept for subjective QoL in patients with schizophrenia. Concerning the structural equation technique results, models for post acute patients with schizophrenia and for the community sample were comparable, with one noteworthy exception: for post acute patients with schizophrenia, only depression had direct effects on QoL self-efficacy, social support and negative coping revealed indirect effects on QoL, whereas for healthy respondents, stress, social support and self-efficacy also affected QoL directly. This finding supports the argument that adaptation to psychosis can be a very difficult and painful period (Jackson and Farmer 1998), which can lead to trauma (McGorry et al. 1991) and depression (Koreen et al. 1993) and thereby affect subjective QoL negatively.

■ Clinical consequences

The proposed model of subjective QoL in post acute patients with schizophrenia has important clinical implications. To improve patients' QoL reducing depression seems to be most effective. Our findings support the position that depression is an integral part of the course of psychotic illness, which needs to be monitored carefully and has to be addressed in special pharmacological and psychological interventions (Siris 1995).

It can be further concluded that interventions which raise patients' perceived social support are likely to enhance their subjective QoL. This has already been shown by Sullivan and co-workers (1992), who postulated that positive relations between psychiatric patients and their families enhance patients' perceived QoL.

Improving self-efficacy is also likely to increase subjective QoL. This supports the position that cognitive behavioural therapy in acute and post acute psychotic patients leads to improved subjective QoL. Especially the COPE-therapy by Jackson and co-workers (1998), which tried to reduce secondary morbidity such as depression, social anxiety and suicide in post-acute first episode patients by promoting self-efficacy and used techniques derived from cognitive therapy, is likely to improve QoL. Furthermore the cognitive-behavioral approaches addressing hallucinations and delusions (Chadwick and Birchwood 1994; Kingdon and Turkington 1994; Drury et al. 1996; Kuipers et al. 1998; Tarrier et al. 1998; Sensky et al. 2000) focus on the patients' self-efficacy by promoting "patients' positive attitudes about psychotic illness in which it is perceived as a manageable, meaningful and containable experience" (Drury et al. 1996, p. 594) and therefore are likely to enhance QoL.

Although constructive, action-oriented and intrapsychic coping strategies appeared to predict surprisingly small amounts of subjective QoL, negative coping behavior explained the highest proportion of general subjective QoL. The significance of coping in our empirical causal model of QoL in post acute patients with schizophrenia supports the contention that the increasing number of psychological interventions targeting the coping strategies of patients with schizophrenia are likely to enhance QoL (Buchkremer et al. 1997; Tarrier et al. 1998; Bechdolf et al. 2003).

Our basic model for overall subjective QoL in post acute patients with schizophrenia links well with a psychosocial concept of intervention and may prove quite useful in exploring how service input impacts on patients' self perceptions, thereby affecting their QOL.

■ Methodological considerations

Although the results of the analyses are promising there are some limitations: The respondents were not randomly selected and may not be representative, although we doubt that this is a significant source of bias. Data was derived from cross-sectional assessments and therefore no conclusions could be drawn on the temporal stability of the postulated relationships.

Particularly, results of the multivariate modelling analysis should be handled with caution, because a larger sample size is needed to provide more reliable parameter estimates and the distribution of PANSS items used to measure depression was negatively skewed. Nevertheless, the tested model has already been established for general population samples implying a replicative nature of our study in regard to a clinical population.

Therefore, we think that the relation of 1 to 4 between observables and participants is sufficient for the cautious conclusions drawn, although the generalizability may be limited. Furthermore, with the help of LISREL analysis structural interrelations of constructs can be investigated and different models can be compared relative to each other. However, it must be emphasized that this approach is based on correlations and it is difficult to gain information on the real causal structure of latent constructs.

There was no control group but split half analyses regarding positive and negative schizophrenic symptoms reconfirmed the findings for the sample as a whole, with one exception. For subjective QoL in patients whose severity of negative symptoms was above the median, we found a different set of predictors. Thus, patients with severe negative symptoms have adapted to their situation differently from patients with low negative symptom scores. Therefore, conclusions cannot be generalized to patient groups with a different clinical status and results are limited to post acute schizophrenic patients with low negative symptom scores. Future research is needed to show if the predictions of the suggested structural model can be reconfirmed in a longitudinal study with a larger sample size and a control group design.

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