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ORIGINAL PAPER

The interrelation of needs and quality of life in first-episode schizophrenia

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Abstract The interrelation between needs for care and quality of life has been described and replicated by several studies. The present work aims to add to the understanding of longitudinal interrelations between needs for care, quality of life, and other outcome measures by analyzing a sample of patients at the onset of schizophrenia. This study relied on data from the EUFEST trial, designed to compare first- and second-generation antipsychotics during 1 year. At baseline, 498 patients have been included. The first (baseline) and the last assessment (12 months after baseline) were used for the analyses. Predictors of quality of life were determined using regression analyses. We tested the complex longitudinal interrelations between baseline and outcome measures with structural equation models. Unmet needs were not definitively confirmed as a predictor of subsequent quality of life, unless unmet needs changing to no needs were separated from unmet needs changing to met needs. Each unmet need that changed to no need enhanced the quality of life (mean score 1–7) by 0.136 scale points. This study suggests that when studying quality of life and needs for treatment, it is crucial to differentiate whether unmet needs disappeared or whether they were met, as the former has a stronger impact on quality of life.

Keywords Psychosis · First episode · Quality of life · Treatment needs · Longitudinal analysis

Introduction

Addressing the needs of psychiatric patients has become an important indicator for assessing the quality of mental

This study is conducted for the EUFEST study group. All authors are listed in Appendix.

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health services. It is understood that each patient has individual needs, but that there are illness-specific needs common to patient groups. Needs of patients could, in principle, be satisfied by providing effective treatment. Needs are commonly differentiated into met and unmet. Unmet needs are ongoing serious problems of an individual patient, whether or not help is provided, whereas met needs are absent or moderate problems because help is provided and successful [23]. For example, an unmet need is when someone does not know where to live after leaving the hospital. The need is met when this person has an interim solution and receives help with finding a new apartment. Met needs are further distinguished from no needs, as they continue to be needs despite the temporary relief afforded by treatment. For example, no need is when the living situation of a patient is satisfactory. If previously unmet needs can be satisfied, or if the number of unmet needs has simply declined over time, it is assumed that treatment has been effective [31]. Although the assessment of treatment needs is widely used, its validity as an outcome measure remains contested as oversimplifying the process of clinical decision making and individual recovery processes of patients [24].

It is assumed that a change from unmet to met needs of patients should improve their quality of life [31]. Enhancing quality of life is a major goal of treatment, especially in patients suffering from severe and chronic mental disorders. Quality of life encompasses, as a broad outcome measure, satisfaction with several domains of individual life. The domains of quality of life and the domains of needs overlap in part (e.g., living situation, work, and social relations) [26]. At least a weak interrelation of the two concepts can be anticipated.

Usually, needs are assessed with structured interviews, the most common being the Camberwell Assessment of Need (CAN) [23] and the Needs for Care Assessment (NCA) [5]. Cross-sectional studies [3, 9, 10, 32, 35, 39] have confirmed the interrelation between unmet needs and quality of life including patients with high, medium, and low levels of functioning [3]. For met needs, the interrelation with quality of life was less consistent. Some studies found a negative association (the more met needs the lower the quality of life) [32, 39], others did not find such an association [10]. The assumption that more met needs would be associated with higher quality of life was not confirmed.

However, cross-sectional studies are not sufficient to resolve questions of causal interrelations. Longitudinal association is one criteria of establishing causality [4]. The few longitudinal studies testing the interrelation of quality of life and needs yielded inconsistent results. Slade et al. found that the average level of unmet needs and changes in unmet needs preceded quality of life [30]. Patient-rated unmet needs were a stronger predictor of subsequent quality of life than social role functioning, psychopathology, satisfaction with services, and therapists' ratings of needs [31]. Hansson and Björkman [9], on the contrary, did not find any longitudinal associations between needs and quality of life.

The aim of the present study was to gain greater insight into the longitudinal interrelation between quality of life, unmet needs, symptom severity, clinical status, and social functioning. As a met need is defined as a need that is met by treatment, it has to be differentiated from a need that has disappeared during treatment. Therefore, we were interested whether the change from unmet needs to met needs [31], but also to no needs is associated with improvement in quality of life. The secondary aim was to describe the interrelation of needs and quality of life in a homogenous sample of patients moving from the acute first episode to the remission and stabilization phases of schizophrenia.

Methods

Database

The present study used the data of the European First-Episode Schizophrenia Trial (EUFEST) [8, 15]. The EUFEST study aimed to compare second-generation antipsychotics with low doses of haloperidol [15]. The main outcome measure was 1-year retention rates of medication. In addition, a battery of outcome and diagnostic measures was assessed at several defined points in time. The present study includes psychosocial and psychopathological outcome measures assessed at baseline and after 12 months, as needs and quality of life were assessed simultaneously only twice, at the beginning and end of the study. Although the EUFEST trial addressed some weaknesses of previous antipsychotic drug trials (for critique of previous studies see [19]), other methodological aspects can be criticized: Among other, EUFEST was not blinded [8] and thus is supposed to favor all second-generation antipsychotics [19]; also, the analytic strategy used in EUFEST has been criticized [7], but most critiques are focused on the comparison of first- and second-generation antipsychotics. The present study does not analyze medication, and therefore most of these limitations do not apply. Limitations relevant to this study are discussed in the limitations section.

Sample

Fifty centers from 13 European countries and Israel were selected for participation. Altogether, 1,047 patients were

screened for eligibility between the December 2002 and January 2006. Inclusion criteria were age between 18 and 40 years, and a DSM-IV diagnosis of schizophrenia, schizophreniform disorder, or schizoaffective disorder, onset of positive symptoms dating back at most 2 years; use of antipsychotic drugs for at most 2 weeks in the previous year or for at most 6 weeks at any time; and no known intolerance or contraindication for one of the study drugs. Diagnoses were confirmed by the International Neuropsychiatric Interview (MINI plus [29]). 498 patients gave informed consent and were randomly allocated to five treatment groups. The study protocol was subjected to the local ethic committees or review boards according to the country specific laws.

Attrition rate

Of the 498 patients initially included, 342 (68.7%) completed according to the protocol. Of the 156 (31.3%) withdrawals, investigators withdrew 6 and 4 did not meet the inclusion criteria. The remaining 146 patients have decided by themselves to quit the study.

Measures

Met and unmet needs were assessed using the CAN [23]. The CAN is a 22-item measure encompassing several domains of life that are potentially problematic for people suffering from mental illness. Domains of life are for example: "psychotic symptoms," "accommodation," "day time activities," "intimate relationship, but also "transport" or "money." For each domain, the presence of needs and the coverage of needs by treatment are collected. Validity and reliability of the CAN are considered to be acceptable [23]. The construction of adequate summary indices is controversial [21, 36–38], but most studies rely on sum scores of met and unmet needs. The CAN allows for ratings by patients and ratings by professionals (e.g., therapists, caseworkers, or research assistants). The Kappa coefficients for the agreement between ratings of professionals and patients are between 0.18 and 0.53 [11, 12, 18, 33, 34, 38]. In the present study, sum scores of patient-rated met and unmet needs are used.

The Manchester Short Assessment of Quality of Life (MANSA) [25] is a widely used measure of quality of life encompassing 16 items, four questions about objective, and twelve questions assessing subjective quality of life by asking patients about their satisfaction with several domains of life. Answers for subjective quality of life are on a 7-point scale ranging from 1 = "could not be worse" to 7 = "could not be better." We used the mean of the 12 patient-rated subjective questions to calculate a quality of life score.

Other measures used in the present study were the PANSS (Positive And Negative Syndrome Scale [16]), the CDSS (Calgary Depression Scale for Schizophrenia [1]) measuring the level of depression in schizophrenia, and the GAF (Global Assessment of Functioning [14]). The Hayward Scale [17] was used to assess compliance (one-item 7-points rating scale with higher scores suggesting better adherence), and prognosis was assessed using a 6-point scale ranging from 1 = best to 6 = bad.

The PANSS measures positive and negative symptoms of schizophrenia and general psychopathology. It is a 30-item structured interview scored by a trained rater and lasts 30–40 min. Scores for positive and negative symptomatology, general psychopathology, and a total score are calculated.

The CDSS is a nine-item self-rating scale that assesses depression in schizophrenia with good reliability [2]. From all items, a total score (mean of ratings) is calculated. A cutoff of seven points refers to a specificity of 82% and a sensitivity of 85% for detecting major depressive episodes [1].

Sociodemographic variables were assessed at baseline. All other measures were assessed at least at visit 1 (baseline) and visit 9 (after 12 months). Observer-rated measures were assessed by site coordinators or co-investigators, e.g., psychiatrists (including trainees in psychiatry), research nurses, or psychologists.

Statistical analyses

To determine whether values at baseline differed from values at the 12-month follow-up, *T* tests for paired samples and Wilcoxon tests were used. All tests were calculated with PASW Statistics 18.0 for Windows.

Regression analysis

The dependent variable in regression analysis was the mean of the 12 items of the MANSA measuring subjective quality of life 12 months after the study begin. Independent variables were the basic sociodemographic characteristics (gender, age, years of education, occupied at baseline), diagnosis, initial medication group (randomization), psychosocial intervention (yes–no), and antipsychotic medication before the beginning of the study (yes–no); baseline quality of life (MANSA sum score), number of met and unmet needs, psychopathology (scores of the PANSS positive and negative symptoms, and the CDSS total mean score), and the global assessment of functioning (GAF) score. Additionally, compliance (Hayward scale) and prognosis were included. Only bivariate significant variables and positive and negative symptoms (because of their importance), were selected for the models including several

predictors simultaneously. Regression models were estimated using PASW Statistics 18.0 for Windows.

Structural equation models

Structural equation modeling (SEM) is the method of choice to study (longitudinal) interactions when predictor variables are closely interrelated (multicollinearity). To the best of our knowledge, there are no studies using SEM to inquire on the longitudinal association between needs and quality of life, with the exception of two studies using graphical chain modeling [27, 31].

We fitted two different structural equation models that both allow for a temporal sequence of unmet needs and change variables. The first aimed at replicating the results of the regression analysis to provide a base for subsequent models. The second model additionally included the number of changes from unmet needs to no needs and from unmet needs to met needs. Both models were developed using a stepwise deletion of paths. Primarily, a saturated model was fitted, with regression paths from all baseline variables to both change variables (met to unmet needs and met to no needs) and with regression paths from all variables to quality of life at follow-up. The model further estimated correlations among baseline variables and correlations among change variables. Starting from the saturated model, the paths with the lowest significance were omitted step by step, i.e., the model was run again after each deletion. The models were fitted using Mplus [22]. The model fit was assessed as suggested by Yu [40].

Results

From baseline to follow-up at 12 months, 78.7% (263 of 334 completers with valid PANSS scores at both points in time) reached a 50% reduction in the PANSS total score, fulfilling the criterion for treatment success defined by Leucht et al. [20]. Major depressive episode (MDE) measured with the CDSS was diagnosed in 36.1% (123 of 341) at baseline; this was reduced to 3.5% (12 of 340) at 12 months. Most of the patients (completers) were in inpatient treatment setting at the beginning of the study (89.8%, 307 of 342) but only 4.7% (16 of 340) at follow-up. In sum, clinical improvement in the total sample was considerable.

Table 1 shows the descriptive statistics of quality of life and needs, clinical and social functioning. At baseline, study completers were more often female and had more (met and unmet) needs, fewer psychosocial interventions, lower quality of life, and better compliance as well as prognosis. Fewer completers came from West Europe.

Figure 1 expresses follow-up values as proportions of baseline values. Comparing change in different outcome measures, it becomes clear that changes were most pronounced in unmet needs rated by patients, positive symptoms (PANSS), and functioning (GAF score).

Predictors of quality of life using regression analysis

The baseline variables associated with quality of life at follow-up were as follows: unmet needs, functioning (GAF), depression (CDSS), prognosis of patient, psychosocial intervention, gender, age, current occupation, and years of education. Associations with outcome quality of life changed in some time-dependent variables once baseline quality of life was included. Table 2 shows the multiple regression analysis results for all bivariate significant predictors of quality of life at follow-up. In multivariate analyses, the model fit improved when baseline quality of life was included as a predictor of quality of life assessed at follow-up (Model 1 vs. Model 2 in Table 2). After including baseline quality of life as a predictor, the baseline assessments of depression, gender, and age remained significant predictors of quality of life at follow-up (Table 2, Models 2, 3). In contrast, the impact of unmet needs on quality of life was no longer significant. Interestingly, more depression at baseline was associated with higher quality of life at follow-up. Younger female patients had higher quality of life at follow-up.

Structural equation models

The first simple structural equation model led to nearly the same results as the regression model 2 in Table 2 (Fig. 2). The longitudinal association between baseline unmet needs and follow-up quality of life approached $P = 0.05$. The second model (Fig. 3) additionally included the number of changes of unmet needs to no needs or to met needs, and age and gender that were significant in regression model 3 (Table 2). Change from unmet needs to no needs was more strongly associated with quality of life than change from unmet needs to met needs (not significant). Fewer unmet needs, more depression, higher baseline quality of life, younger age, and being female were associated with higher quality of life at follow-up. Higher depression scores at baseline implicated more change to no needs, and therefore, higher quality of life at follow-up. Similarly, a higher level of positive symptoms was associated with more change from unmet needs to no needs. Younger female patients also had more unmet needs changing to no needs. Only depression and unmet needs were associated with the change to met needs (higher depression scores were associated with fewer changes to met needs).

Table 1 Quality of life, needs, baseline sociodemographic data, clinical status, and social functioning

	Baseline total		Baseline completers		Drop outs		Difference drop outs − completers[a]
	Mean ± SD/ percent	*N*	Mean ± SD/ percent	*N*	Mean ± SD/ percent	*N*	*P*
Age at baseline	25.98 ± 5.55	(498)	26.05 ± 5.64	(342)	25.83 ± 5.38	(156)	0.618
Gender (women)	40.2%	(200)	43.6%	(149)	32.7%	(51)	0.024
Cultural region	–		–		–		0.000
West Europe	34.9%	(174)	28.9%	(99)	48.1%	(75)	–
East/Central Europe	51.4%	(256)	59.6%	(204)	33.3%	(52)	–
Israel	13.7%	(68)	11.4%	(39)	18.6%	(29)	–
Occupation at baseline (yes)	46.6%	(231)	46.5%	(159)	46.8%	(72)	1.000
Antipsychotic naïve at baseline	32.5%	(162)	30.7%	(105)	36.5%	(57)	0.216
Years of education	12.46	(493)	12.58	(341)	12.17	(152)	0.140/0.181
Medication							
Haloperidol	20.7%	(103)	19.9%	(68)	22.4%	(35)	0.227
Olanzapine	21.1%	(105)	24.0%	(82)	14.7%	(23)	–
Quetiapine	20.9%	(104)	20.5%	(70)	21.8%	(34)	–
Amisulpride	20.9%	(104)	20.2%	(69)	22.4%	(35)	–
Ziprasidone	16.5%	(82)	15.5%	(53)	18.6%	(29)	–
DSM-III-R diagnosis	–		–		–		0.603
Disorganized, catatonic, undifferentiated	8.4%	(42)	7.3%	(25)	10.9%	(17)	–
Paranoid	44.8%	(223)	45.3%	(155)	43.6%	(68)	–
Schizophreniform	39.8%	(198)	40.1%	(137)	39.1%	(61)	–
Schizoaffective	7.0%	(35)	7.3%	(25)	6.4%	(10)	–
Psychosocial intervention	14.1%	(70)	11.4%	(39)	19.9%	(31)	0.018
Met needs patient, sum	2.59 ± 2.57	(470)	2.78 ± 2.73	(333)	2.15 ± 2.06	(137)	0.007/0.034
Unmet needs patient, sum	2.04 ± 2.07	(470)	2.19 ± 2.14	(333)	1.66 ± 1.82	(137)	0.012/0.013
MANSA	4.04 ± 0.92	(483)	3.98 ± 0.90	(339)	4.19 ± 0.96	(144)	0.023/0.022
GAF	40.03 ± 13.51	(490)	40.72 ± 13.50	(341)	38.46 ± 13.44	(149)	0.087/0.107
PANSS total score	88.53 ± 20.63	(487)	89.06 ± 20.69	(340)	87.29 ± 20.49	(147)	0.386/0.371
PANSS positive symptoms	23.13 ± 6.19	(489)	23.36 ± 6.17	(340)	22.59 ± 6.23	(149)	0.205/0.138
PANSS negative symptoms	21.23 ± 7.62	(489)	21.14 ± 7.73	(341)	21.42 ± 7.41	(148)	0.714/0.793
CDSS, sum score	5.07 ± 4.87	(488)	5.27 ± 4.88	(341)	4.62 ± 4.84	(147)	0.176/0.140
Prognosis by investigators	3.19 ± 1.19	(495)	3.10 ± 1.18	(342)	3.39 ± 1.19	(153)	0.014/0.014
Compliance (at 1 months)	5.57 ± 1.20	(453)	5.66 ± 1.16	(337)	5.30 ± 1.29	(116)	0.006/0.006

[a] Significance of differences between baseline completers and dropouts were calculated for continuous/count/ordinal variables with *t* tests (first *P*-value), to control for non-normal distributions with the Mann–Whitney test (second *P*-value) and with the Chi-square tests for nominal variables

Discussion

The present study aimed to explore the temporal interrelation between quality of life, unmet needs, and potentially associated clinical measures. It used a longitudinal sample of patients suffering from first episodes of schizophrenia. We believe there is no published study of a comparably homogenous sample at the onset of illness. Not surprisingly, there were marked improvements in all social and psychopathological outcome indicators over time. While previous studies [30, 31] found a longitudinal interrelation between needs and quality of life, this finding was not clearly confirmed by our study. We used statistical techniques that allowed for a differentiation between needs and the change from unmet needs to no needs. In this sample of first-episode patients, the change of unmet needs to no needs had a stronger impact on quality of life than needs being met. This is self-evident but indicates that the longitudinal association between the two constructs depends not on the mere reduction in, but on the specification what happened to the unmet needs.

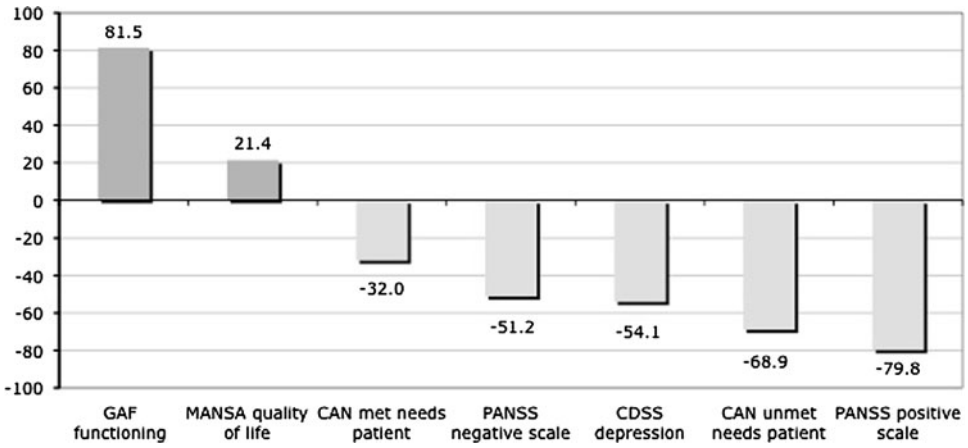

Fig. 1 Difference between T1 scores and T9 scores expressed in percent of T1 values (vertical axis = difference scores). Sample of completers ($N = 326$)

Table 2 Regression model of MANSA sum score at follow-up (dependent variable) and the following predictors: baseline clinical variables (Model 1), baseline MANSA sum score, and baseline clinical variables (Model 2), baseline MANSA sum score, baseline clinical variables, and sociodemographic variables (Model 3) ($N = 326$)

	B	Std	*B* std	*T*	*P*
Model 1[a]	4.737	.317		14.949	.000
Unmet needs	−.057	.023	−.149	−2.488	*.013*
CDSS score	.016	.010	.094	1.574	.117
GAF score	.006	.004	.097	1.576	.116
PANSS positive subscale	−.003	.008	−.022	−.369	.712
PANSS negative subscale	−.001	.006	−.013	−.216	.829
Model 2[b]	3.659	.374		9.772	.000
Unmet needs	−.034	.023	−.089	−1.507	.133
CDSS score	.026	.010	.158	2.672	*.008*
GAF score	.004	.004	.073	1.219	.224
PANSS positive subscale	−.003	.008	−.025	−.425	.671
PANSS negative subscale	−.001	.006	−.007	−.117	.907
MANSA total score	.259	.052	.286	4.988	*.000*
Model 3[c]	4.399	.493		8.932	.000
Unmet needs	−.032	.022	−.082	−1.408	.160
CDSS total score	.026	.010	.158	2.671	*.008*
GAF score	.003	.004	.055	.933	.351
PANSS positive subscale	−.004	.008	−.027	−.476	.634
PANSS negative subscale	.000	.006	−.001	−.025	.980
MANSA total score	.236	.052	.261	4.572	*.000*
Patient age at randomization	−.020	.008	−.135	−2.581	*.010*
Gender	−.291	.087	−.176	−3.360	*.001*
Education (in years)	.013	.016	.045	.808	.420
Current occupation	.081	.094	.050	.869	.385
Psychosocial intervention	−.229	.133	−.090	−1.723	.086
Prognosis by investigators	−.036	.038	−.052	−.938	.349

Italicised values indicate significant predictors ($P < 0.05$)

[a] $R = .193$; R-sq = .037; R-sq-k = .022

[b] $R = .327$; R-sq = .107; R-sq-k = .090

[c] $R = .420$; R-sq = .176; R-sq-k = .145

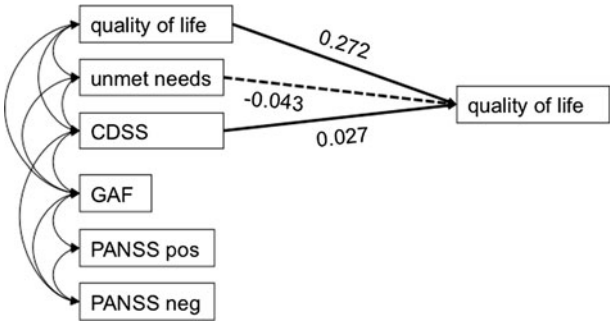

Fig. 2 SEM model replicating regression model 2 (Table 2) ($N = 330$). Only cross-lagged significant paths are depicted, even though cross-sectional and autoregressive paths were estimated. *Dashed line* means nearly significant. Chi-square value = 5.671, $df = 8$, $P = 0.6840$; CFI = 1.000, TLI = 1.037; RMSEA = 0.000, SRMR = 0.030; Sample of completers with values on all variables ($N = 330$)

Needs and quality of life

Our results suggest that the interrelation between quality of life and unmet needs is due to cross-sectional rather than longitudinal association in first-episode patients. The weak evidence for a longitudinal association challenges the assumption of a causal interrelation of unmet needs and quality of life. Using conventional regression, the association between earlier unmet needs and subsequent quality of life found by previous studies was confirmed only if baseline quality of life was omitted. With the SEM modeling technique, the longitudinal impact of earlier unmet needs on subsequent quality of life was not confirmed unless meeting needs were differentiated from needs that changed to no needs during the study. One would expect that any non-random, strong effect would have shown up unequivocally in both longitudinal methodological approaches used. There are not many longitudinal studies with which to compare our results. Slade et al. [31] found a relation of earlier unmet needs with later quality of life.

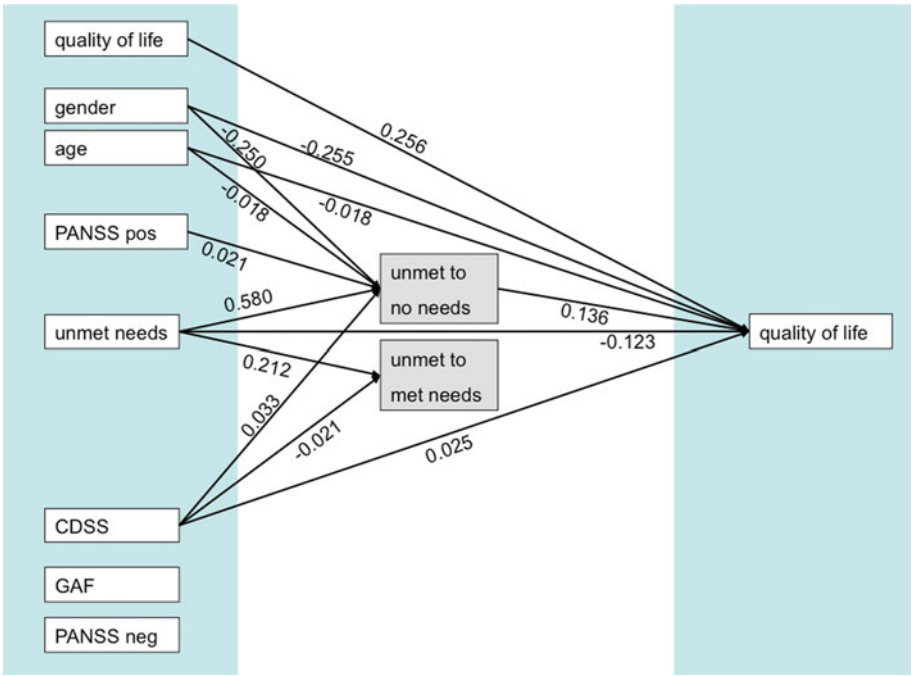

Fig. 3 SEM model with same covariates as the model in Fig. 2, but including age and gender, and differentiating between unmet needs that change to no needs and unmet needs that change to met needs ($N = 330$). Chi-square value = 15.037, $df = 18$, $P = 0.6595$; CFI = 1.000, TLI = 1.010; RMSEA = 0.000, SRMR = 0.026; Sample of completers with values on all variables ($N = 330$)

Another study [30] using random coefficient models found an effect of change in unmet needs as well as mean level of unmet need on quality of life. Earlier longitudinal studies testing the impact of psychopathology and functioning but not needs on quality of life proposed weak or no predictors of subjective quality of life using graphical chain modeling [27] or regression analysis [28]. Overall, most available studies confirm a longitudinal effect of unmet needs on quality of life. Met needs had an even more inconsistent and weaker association with quality of life in our study. No study found that more met needs were interrelated with higher quality of life. Met needs appear to have the implication of something missing, despite them being met. In other words, met needs are better than unmet needs, but cannot be equated with health or well-being. This is in line with our finding that quality of life was more positively influenced by unmet needs that diminished than by unmet needs that were met. Therefore, the reduction in unmet needs does not enhance quality of life in any case. Meeting a need means that patients are still in need of help in this area of life. This result is intuitively compelling. But it sheds another light on what is measured when assessing needs, namely, a conglomerate of different aspects of illness, treatment, and recovery. Granted that treatment implies the meeting of patient's needs, treatment only has a relatively marginal influence on the improving of quality of life in our sample. But what has caused the change to no needs that had a stronger impact on quality of life? The EUFEST trial describes a homogenous sample moving through very different stages of schizophrenia. At baseline, patients were in the acute phase and nearly all in hospital care. At the 12-month follow-up, most were outpatients and in remission or stabilization phase of their illness. Additionally, patients suffering from first-episode schizophrenia have a more favorable treatment response than more chronically ill patients [13]. This might help to explain why there were so many needs for care that changed to no needs.

One important question is how unmet needs could be changed to no needs by treatment? Is there a direct way from unmet needs to no needs? Is the change to no needs also a result of treatment, or has this to be understood as a spontaneous remission? Those questions are difficult to answer, but we recommend that results based on treatment needs should be interpreted only in combination with other measures that validate different aspects of progress.

There are several explanations for the unstable longitudinal interrelation of unmet needs and quality of life found in this study. A previous study compared first admitted and long-term hospitalized patients. It detected stronger associations between needs and quality of life in the long-term hospitalized sample [26]. As our patients were all in early stages of schizophrenia, this could explain the missing associations. In early stages of schizophrenia, there is considerable change; improving patients may be more easily influenced in both positive and negative directions. Other non-treatment factors may outweigh treatment factors at the beginning of an illness. Longer established schizophrenia is associated with an increasing reliance of patients on professionals and health services. The reduced importance of treatment systems in our early sample may explain some of the relatively low impact of

treatment needs on quality of life in our sample. The instability of the regression models may also be due to the different situation (e.g., hospital and outpatient care) of patients at baseline and at follow-up.

The vast number of possible influences on the relationship between needs and quality of life in mind helps explain the inconsistent results in different studies. Further influences are whether routine outcome data or research data are used, which diagnostic groups are included and in which stage of illness and setting (in hospital vs. outpatients) and lastly treatment received. In addition, there are several quality of life instruments in use, and needs can be rated by therapists, research assistants, or the patients themselves.

Other predictors of quality of life

Longitudinal studies of the interrelation of unmet needs with other outcome measures than quality of life are sparse and provided inconsistent results. An advantage of the model used is that it explains the change in quality of life. By including baseline quality of life, the path from baseline to follow-up levels of quality of life represents the values remaining stable. The other paths to quality of life explain change. In this population of patients, new to their illness, depression was longitudinally more clearly interrelated with quality of life than positive and negative symptoms and unmet needs. Patients with more depression at baseline had more changes to no needs, and therefore, a better quality of life at follow-up. The diminishing of unmet needs was, in addition to higher depression scores, related to more positive symptoms at baseline. Meeting needs were predicted by lower depression scores, but not by positive symptoms. There must be patients with marked symptom load at baseline who experience alleviation in terms of diminishing need for care for symptoms. This in turn influences their subjective quality of life. Interestingly, there was no direct effect of positive symptoms, but patients with more depression at baseline tended to have a better quality of life at follow-up. Functioning was not associated with quality of life. This is in line with the finding that social functioning and quality of life are independent in schizophrenic patients living in the community [6]. Female gender and younger age consistently influenced change and quality of life positively. For further research, it would be interesting to know more about those complex interrelations.

Future research

In sum, there is a need for research clearing the following points: The differential impact of needs that disappear and need that is met on quality of life should be replicated using more measurements and with different patient groups. Treatment research is needed to study the processes that lead to change in needs and to find out what causes needs to disappear. Experimental studies are necessary to determine the direction of causality.

Limitations

Naturalistic studies as ours are limited in their capacity to determine causal effects. If the conditions (independent variables) are not manipulated experimentally, causal hypotheses cannot be tested with certainty. No definite discrimination between correlation and causality is possible. Results of this study should be interpreted as a first step in proving that the change from unmet to met needs leads to an improvement of quality of life.

An impediment on the validity of results was drop out. This is a problem of most longitudinal studies. Moreover, there was a difference between patients who completed the study and patients who dropped out for a variety of reasons. Adherent patients were those with more needs, higher quality of life, and better compliance as well as prognosis at baseline. Strictly speaking, our results are valid only for first-episode patients with higher baseline quality of life. We refrained from using imputation of missing data, because this does not reduce the risk of biased results when only two measurements are available. More assessments would allow for better imputation solutions or for calculating random coefficient models/multilevel models that use all available information.

Finally, the sample of the EUFEST study might not represent the average first-episode patient, as patients who signed informed consent might differ from patients who did not, all patients were in inpatient treatment, and centers were not selected randomly.

Conclusions

This study questions the generally accepted assumption that meeting needs enhance quality of life. During the transition from acute to more stable phases of illness, unmet needs are associated with outcome quality of life only when they have diminished until the outcome assessment. For further research, it is important to differentiate meeting unmet needs and unmet needs that change to no needs.

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Conflict of interest RSK has received grants, honoraria for education programmes, or served as consultant for Astellas, AstraZeneca,

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Appendix

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