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Subjective quality of life and its determinants in a catchment area based population of elderly schizophrenia patients

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ABSTRACT

Background: Subjective quality of life (SQOL) is an established outcome measure in schizophrenia. In spite of the substantial proportion of elderly in the total schizophrenia population, evaluation of their SQOL and its determinants has been scarce and findings from epidemiological samples are lacking.
Methods: We assessed SQOL in elderly Dutch patients with schizophrenia or schizoaffective disorder (n = 107; mean age 68 years), treated within a psychiatric catchment area. Demographic, clinical and social variables were evaluated for their impact on SQOL.
Results: The mean SQOL score was 4.83, moderately surpassing the midpoint of the SQOL scale. Nearly half of all patients (47.7%) reported an overall favorable SQOL. Of the total variance in SQOL, clinical variables explained 50%, and social variables explained 16%, while demographic factors did not contribute. In multivariable analysis, less self-reported depressive symptoms, worse global neurocognition, and higher observer-based level of social functioning significantly predicted a higher SQOL, explaining 53% of the total variance.
Conclusion: The relatively high level of SQOL in this epidemiological sample of elderly patients is in line with what has been reported for both older and younger schizophrenia populations. Depressive symptoms are a robust predictor of SQOL in late life schizophrenia, clearly outweighing psychotic symptoms. This finding has major clinical relevance, as depression is amenable to therapeutic intervention.

1. Introduction

Subjective quality of life (SQOL) is now an established outcome measure in the care of persons with schizophrenia (Awad et al., 2012). SQOL refers to a person's sense of well-being and satisfaction with life. While aiming at a global perspective, it is generally seen as a multidimensional concept involving various life domains. Although the capacity for self-appraisal in individuals with psychotic disorders has been questioned due to their lack of insight and cognitive restrictions, it has been demonstrated that SQOL can be reported by schizophrenia patients with a high degree of reliability and concurrent validity (Voruganti et al, 1998).

Identifying the critical factors that influence SQOL in schizophrenia has major clinical relevance, as it may help to design services and interventions that can assist patients in leading more fulfilling lives. Research of SQOL in schizophrenia has been hampered by disparities in definitions and measurements. Still, a number of variables associated with SQOL emerge from the existing literature. Psychiatric symptoms have consistently been found to relate negatively to SQOL, but they explain only a modest proportion of variance. A recent meta-analysis demonstrated that general psychopathology (e.g., depression, anxiety) contributes stronger to SQOL than positive and negative psychotic symptoms (Eack and Newhill, 2007). While neurocognition is largely unrelated to SQOL (Tolman and Kurtz, 2012), social cognition contributes to SQOL, with patients with a relatively unimpaired theory of mind reporting a lower SQOL (Maat et al., 2012). Cross-sectional studies have suggested that favorable social factors (e.g., independent living, more social support) contribute to a higher SQOL (Yanos and Moos, 2007). In the long-term, improvement in psychosocial factors appears to increase SQOL (Ritsner et al., 2012). Furthermore, meeting unmet needs for care (as reported by patients) may cause SQOL to improve (Slade et al, 2005).

In comparison, the number of studies dedicated to quality of life in late life schizophrenia has been modest. This stands in contrast to the substantial proportion of elderly in the total schizophrenia population (Meesters et al., 2012), and the expected disproportionately rapid growth of their numbers in the next decades (Cohen et al., 2008). A number of studies assessed specific aspects of quality of life in older schizophrenia patients, focussing for example on health-related functioning and well-being (e.g. Mittal et al., 2006). A recent cross-sectional study (Folsom et al., 2009) of middle-aged and older community-dwelling

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patients with schizophrenia found older age to be associated with greater mental health quality of life, leaving open the possibility that quality of life may actually improve with aging.

To the best of our knowledge, only one study measured SQOL using a generic concept. Bankole et al. (2007) found a lower SQOL in elderly schizophrenia patients in New York (n = 198; mean age 62 years), compared to age-matched peers. Notably, the mean SQOL in the schizophrenia group was well above the threshold for a positive level of satisfaction and the absolute differences between the two groups were only modest. Of the 19 selected independent variables, in regression analysis six were significantly associated with a higher SQOL: fewer depressive symptoms, more cognitive deficits, fewer acute life stressors, fewer medication side effects, lower financial strain, and better self-rated health. Overall, the model explained 55% of variance in SQOL. However, the generalizability of these findings is uncertain, as the sample was restricted to community-living patients with early onset schizophrenia.

To expand our knowledge on SQOL in late life schizophrenia, we evaluated SQOL in an epidemiological representative sample of elderly patients with schizophrenia or schizoaffective disorder, aiming to include all individuals that were in contact with mental health services within a Dutch psychiatric catchment area. A number of demographic, clinical and social variables identified in the literature were evaluated for their impact on SQOL. We sought to answer the following questions: (1) what is the level of SQOL and its variability among participants?, (2) which variables predict SQOL and to what extent do the predicting variables overlap in their effects on SQOL?, (3) what part of the variance in SQOL is explained by the combined variables?

2. Method

2.1. Participants

Data were derived from an observational, cross-sectional study of an epidemiological sample of older schizophrenia and schizoaffective patients. Details of the study methods are provided elsewhere (Meesters et al., 2011). Briefly, between March 2006 and September 2008 we recruited 177 patients aged 60 years and over, within the psychiatric catchment area of the southern district of Amsterdam. A total of 107 patients were able and willing to provide written informed consent for the present study (Fig. 1). Basic demographic and clinical characteristics did not differ between consenting and non-consenting patients, with the exception of female gender ($\chi^2 = 4.80$; DF = 1; p = 0.03) and compulsory admissions ($\chi^2 = 7.01$; DF = 1; p = 0.008), that were more frequent among non-consenting patients. In consenting patients diagnosis was confirmed through the Mini-International Neuropsychiatric Interview Plus (MINI-Plus; Sheehan et al., 1998): 84 patients (78.5%) were diagnosed with schizophrenia (DSM-IV-TR: 295.10, 295.20, 295.30, 295.60, 295.90; American Psychiatric Association, 2000), and 23 patients (21.5%) with schizoaffective disorder (DSM-IV-TR: 295.70). The study was approved by the Medical Ethics Committee of the VU University Medical Center, Amsterdam, The Netherlands.

2.2. Instruments

We documented three predictor variable domains (demographic, clinical, social), comprising 17 independent variables. Demographic data were derived from medical records and confirmed in the face-to-face interviews. Age at onset was defined as the earliest age at which in retrospect DSM-IV-TR criteria for the disorder were fulfilled (Meesters et al., 2012). Psychiatric symptomatology was assessed by the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987), the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) and the Beck Anxiety Inventory (BAI; Beck, 1990). The PANSS consists of 30 items, rated by the interviewer on a scale from 1 (absent) to 7 (extreme). Total PANSS scores may range from 30 to 210. The positive and the negative PANSS subscales both comprise 7 items (scoring range 7 to 49). Symptomatic remission status was determined through a low score on eight individual PANSS items (severity criterion of the Remission in Schizophrenia Working Group; Andreasen et al., 2005), with remitted participants in addition having had no psychiatric hospitalization in the previous six months (modified time criterion). The CES-D is a 20-item self-report scale, measuring the presence and duration of depressive symptoms during the previous week. Summation results in scores ranging from 0 to 60. The BAI is a 21-item self-report scale, that evaluates presence and intensity of anxiety-related symptoms during the previous week. Scores range from 0 to 63. Global cognitive status was assessed through the Mini Mental State Examination (MMSE; Folstein et al., 1975). In addition, the presence of ten chronic physical disorders was evaluated (sum score 0–10).

To evaluate their social network, participants estimated the number of persons outside of their household, with whom they had regular and meaningful contact. Also, the number of persons (partner included, if present) who they experienced as being emotionally or materially supportive to them, was documented. Self-report of involvement in ten social activities was measured through the Social Participation Scale (Depla et al., 2003), with scores ranging from 0 (no activities) to 20 (regular participation in all activities). The Social and Occupational Functioning Assessment Scale (SOFAS; American Psychiatric Association,

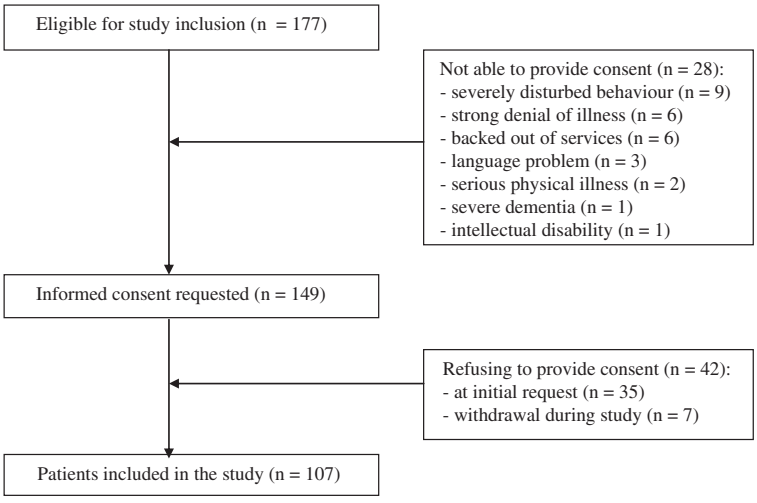

Fig. 1. Flow diagram of the study.

2000) was scored by the interviewer, to assess the level of social functioning in the previous week. SOFAS scores may range from 1 to 100, with scores ≥61 indicating little or no social impairments.

SQOL was evaluated with the Manchester Short Assessment of Quality of Life (MANSA; Priebe et al., 1999). The MANSA is a brief and modified version of the well-established Lancashire Quality of Life Profile (Oliver et al., 1997), and is easily applicable in older patients. The instrument applies a generic concept of quality of life, assessing patient satisfaction with 12 aspects of life. Satisfaction is rated on 7-point rating scales, ranging from 1 ('could not be worse') to 7 ('could not be better'), with 4 ('alternately satisfied and dissatisfied') as a midpoint. The total MANSA score is the mean of the 12 individual item scores. The MANSA was completed in an oral interview.

Interviews were conducted by a psychiatrist (the first author) and two experienced psychiatric residents (diagnostic interview, PANSS, MMSE), and by three well-trained psychiatric nurses (other variables). Training for the PANSS included investigator meetings both at the start and during the study, with rating of videotaped interviews, followed by discussion and review of ratings. The internal reliability of the MANSA was good (Cronbach's alpha = 0.84). The Cronbach's alpha scores of the other employed scales were: PANSS total scale (0.81), PANSS positive scale (0.59), PANSS negative scale (0.75), CES-D (0.89), BAI (0.89), Social Participation Scale (0.74), MMSE (0.64).

2.3. Statistical analysis

To examine the relationship between the independent variables and SQOL, bivariate analyses were performed with the total MANSA score as the dependent variable. The explained variances accounted for by each of the three domains (demographic, clinical, social) were calculated. In multivariable analysis, we initially examined each domain, entering those variables which had attained a significance level of $p < 0.10$ in bivariate analysis. In addition, age and MMSE-score were entered, because of their theoretical importance in this elderly study population. The BAI score was not included in the multivariable analysis, as it was strongly correlated with the CES-D scale (Pearson's $r = 0.72$, $p < 0.001$). The number of confidants was also excluded, as it was highly correlated with the network size (Pearson's $r = 0.58$, $p < 0.001$). Next, all variables with $p < 0.10$ in the domain-specific analyses were entered in the final multivariable analysis. The dependent variable met assumptions of normality and homogeneity of variance. There was no collinearity among the independent variables. Data were analyzed using the Statistical Package of the Social Sciences (SPSS), version 20.0.

3. Results

3.1. Patient characteristics

Characteristics of the study sample are presented in Table 1. The mean age of the participants was 67.9 years (range 60–94 years), two-thirds were women. A large majority (68.2%) lived independently, while 23.4% was living in psychiatric residential care (21.5%), or in a general residential facility (1.9%). 8.4% of the participants was hospitalized at the time of study. In one-third, the psychotic disorder developed after the age of 40. PANSS scores indicated that on average participants had comparatively mild levels of psychotic symptoms. MMSE scores demonstrated that most participants had no clinically significant global cognitive impairment; however, 15.9% of all participants had a MMSE score below 24. Of all participants 28% had either a very small or no social network outside of their household. The mean SOFAS score (52.4) corresponds to moderate difficulty in social functioning.

3.2. Subjective quality of life

Table 2 presents the single item scores on the MANSA, ranging from 4.53 ± 1.60 (life in general) to 5.10 ± 1.39 (personal safety). The mean score of all MANSA items was 4.83 ± 0.96. Nearly half of the patients (47.7%) reported an overall favorable quality of life (mean MANSA score ≥5).

Table 1
Characteristics of the patient sample (n = 107).

Age: mean years (SD)	67.9 (7.4)
Gender: male (%)	36 (33.6)
Marital status: actual partner (%)	21 (19.6)
Residence: independent (%)	73 (68.2)
Dependent (%)	25 (23.4)
Hospitalized (%)	9 (8.4)
Education[a]: low (%)	29 (27.4)
Middle (%)	44 (41.5)
High (%)	33 (31.1)
Diagnosis: schizophrenia (%)	84 (78.5)
Schizoaffective disorder (%)	23 (21.5)
Age at onset: mean years (SD)	37.3 (16.5)
Early (<40 years) (%)	71 (66.4)
Late (40–60 years) (%)	25 (23.4)
Very late (≥60 years) (%)	11 (10.3)
Duration of illness: mean years (SD)	30.6 (14.5)
PANSS score: total (mean, SD)	58.5 (15.3)
Positive subscale (mean, SD)	13.8 (5.3)
Negative subscale (mean, SD)	16.0 (6.2)
Symptomatic remission (%)	31 (29.0)
CES-D score[a]: mean (SD)	16.3 (11.8)
BAI score: median (25–75%)	7 (3–16)
MMSE score: median (25–75%)	28 (26–29)
Mean (SD)	26.8 (3.3)
Chronic physical disorders: median (25–75%)	1 (0–2)
Network size: small (0–1 person) (%)	30 (28.0)
Medium (2–5 persons) (%)	41 (38.3)
Large (≥6 persons) (%)	36 (33.6)
Confidant/supportive person: none (%)	33 (30.8)
1 person (%)	33 (30.8)
≥2 persons (%)	41 (38.3)
Social Participation Scale score: mean (SD)	9.3 (4.3)
SOFAS score: mean (SD)	52.4 (13.2)

PANSS = Positive and Negative Syndrome Scale; CES-D = Center for Epidemiologic Studies Depression scale; BAI = Beck Anxiety inventory; MMSE = Mini Mental State Examination; SOFAS = Social and Occupational Functioning Assessment Scale.
[a] 1 case missing.

3.3. Predictors of subjective quality of life

Table 3 presents the results of the bivariate analyses. Within the demographic domain, a statistical trend was found for gender, with female gender being associated with a higher SQOL. Within the clinical

Table 2
Manchester Short Assessment of Quality of Life item scores[a].

	Score		Participants with favorable sQoL[b]	
	Mean	SD	N	%
Item				
Life in general	4.53	1.60	58	54.2
Not having paid employment	4.93	1.65	72	67.3
Financial situation	4.85	1.66	69	64.5
Number and quality of friendships	4.72	1.53	62	57.9
Daily activities	4.78	1.37	66	61.7
Accommodation	5.03	1.67	73	68.2
Personal safety	5.10	1.39	76	71.0
Fellow residents (partner, others)[c]	4.94	1.55	66	61.7
Sex life	4.68	1.76	64	59.8
Relationship with family	4.86	1.67	65	60.7
Physical health	4.68	1.58	61	57.0
Mental health	4.83	1.50	72	67.3
Total score	4.83	0.96	51	47.7

[a] Scoring range: 1 (could not be worse) to 7 (could not be better).
[b] Mean score ≥5.
[c] Patients without fellow residents reported their satisfaction with living alone.

Table 3
Bivariate analysis of demographic, clinical and social variables, with subjective quality of life as dependent variable (in bold, p-values < 0.10).

	n	β	p
Demographic domain			
Age	107	0.11	0.26
Female gender	107	0.19	**0.052**
Actual partner	107	−0.10	0.29
Residence (independent vs. hospitalized)	107	0.08	0.63
(dependent vs. hospitalized)		0.04	0.80
Education (high vs. low)	106	−0.06	0.60
(Medium vs. low)		0.07	0.55
Clinical domain			
Age at onset	107	0.14	0.15
Duration of illness	107	−0.11	0.28
PANSS: positive subscale score	107	−0.20	**0.04**
Negative subscale score	107	−0.04	0.70
Symptomatic remission	107	0.10	0.30
CES-D score	106	−0.68	<**0.001**
BAI score	107	−0.48	<**0.001**
MMSE score	107	−0.06	0.55
Chronic physical disorders	107	−0.18	**0.07**
Social domain			
Network size (large vs. small)	107	0.25	**0.03**
(Medium vs. small)		0.03	0.78
Confidant/supportive person (≥2 persons vs none)	107	0.16	0.17
(1 person vs none)		0.28	**0.01**
Social Participation Scale score	107	0.22	**0.02**
SOFAS score	107	0.37	<**0.001**

domain, the PANSS positive subscale score, the CES-D score, the BAI score and the number of chronic physical disorders were negatively associated with SQOL. In the social domain, the network size (large vs. small), the availability of a confidant/supportive person (1 person vs. none), the Social Participation Scale score and the SOFAS score were positively associated with SQOL. Of the total variance in SQOL, clinical predictors explained 50% ($F = 12.8$, $df = 9, 105$, $p < 0.001$), while social predictors explained 16% ($F = 4.41$, $df = 6, 106$, $p = 0.001$). Demographic predictors did not significantly contribute to SQOL variance ($F = 1.04$, $df = 7, 105$, $p = 0.41$).

In multivariable analysis (Table 4), three variables within the clinical domain (PANSS positive score, CES-D score, MMSE score) significantly predicted SQOL. Within the social domain, only the SOFAS score was predictive of SQOL. In the final multivariable analysis (entering gender, PANSS positive subscale score, CES-D score, MMSE score, and SOFAS score), the CES-D score ($\beta = -0.62$, $p < 0.001$), the MMSE score ($\beta = -0.22$, $p = 0.002$), and the SOFAS score ($\beta = 0.23$, $p = 0.003$) remained predictive of SQOL. This final model explained 53% of the total variance in SQOL ($F = 24.8$, $df = 5, 105$, $p < 0.001$).

4. Discussion

4.1. Subjective quality of life

In this epidemiological cohort of elderly patients with schizophrenia or schizoaffective disorder, the mean SQOL score was 4.83, moderately surpassing the midpoint of the 1–7 scale. Nearly half of all participants (47.7%) reported to experience a global favorable SQOL. The variation between the individual SQOL-domains was only modest. The high level of SQOL is notable, but compares well to what Bankole et al. (2007) reported in their convenience sample of older community-living patients in New York City. Relatively high levels of SQOL have also been found in younger schizophrenia patients (Katschnig, 2000). In addition, patients with schizophrenia generally rate their SQOL as more favorable than those with mood and neurotic disorders, while in all three disorders a positive association between age and SQOL has been demonstrated (Priebe et al., 2010).

SQOL relates to the gap between the aspirations of an individual and his/her perceived reality. Comparisons with one's original ambitions, as well as comparisons with the life situation and achievements of others, influence appraisal of SQOL. Internal standards of comparison are subject to change over time, as patients adjust to their disorder and its consequences (Franz et al., 2000). As a result, while living in conditions that may seem adversarial and unpleasant to others, patients can nevertheless be relatively satisfied with their life. This is reflected by the low correlations between SQOL and objective indicators of quality of life in schizophrenia (Priebe, 2007). In elderly populations, a survivor bias may also come into play, as it is well conceivable that higher functioning patients stand a better chance to survive into old age. A longitudinal study design would be needed to further clarify the relation between aging and SQOL in schizophrenia.

4.2. Predictors of subjective quality of life

In bivariate analysis, nine of the 18 variables predicted SQOL significantly ($p < 0.05$). In the clinical domain, having less positive, depressive or anxiety symptoms related to a higher SQOL. In the social domain, a larger network size, presence of a confidant person, greater social participation, and higher level of social functioning were associated with a higher SQOL. In the final multivariable analysis, having less depressive symptoms and better social functioning were the remaining predictors of a higher SQOL. In addition, a significant effect of global neurocognition was found in the multivariable analysis, with worse cognitive functioning predicting a higher SQOL.

Mood symptoms accounted for a large amount of SQOL variance (38%). Levels of self-reported depressive symptoms in our sample were relatively high, with 46.2% of the patients scoring above the threshold for clinically relevant depression in the general population (CES-D score ≥16). In contrast, individual participants with higher CES-D scores generally did not fulfil the DSM-IV criteria for major depression, a finding which has been reported before in elderly schizophrenia patients (Jin et al., 2001). Bankole et al. (2007) also found that higher self-reported depression was associated with a lower SQOL, although depressive symptoms explained less variance in their study than in ours. The same holds true for younger schizophrenia patients, for whom the influence of depressive symptoms on SQOL has consistently been demonstrated, but with smaller impact than in our study (Eack and Newhill, 2007).

The relationship between self-reported depressive symptoms and SQOL needs to be evaluated cautiously. First, a potential bias may be involved, as SQOL and self-reported depressive symptoms may partially reflect the same underlying affective state (Priebe, 2007). Next, while depressive mood may lead to a lower SQOL, experiencing a lower SQOL may in turn generate negative affective consequences. The

Table 4
Linear regression analysis of demographic, clinical and social variables predicting subjective quality of life (in bold, p-values < 0.10).

	Multivariable (domain)			Multivariable (all)		
	β	df	p	β	df	p
Demographic domain						
Age	0.07	106	0.52			
Female gender	0.17	106	**0.09**	0.03	105	0.66
Clinical domain						
PANSS: positive subscale score	−0.17	105	**0.02**	−0.11	105	0.15
CES-D score	−0.69	105	<**0.001**	−0.62	105	<**0.001**
MMSE score	−0.18	105	**0.01**	−0.22	105	**0.002**
Chronic physical disorders	0.05	105	0.50			
Social domain						
Network size (large vs. small)	−0.02	106	0.89			
(Medium vs. small)	−0.16	106	0.20			
Social Participation Scale score	0.12	106	0.24			
SOFAS score	0.35	106	**0.002**	0.23	105	**0.003**

cross-sectional design of our study prohibits further interpretation of causality. However, evidence from prospective studies in younger schizophrenia patients suggests that recovery of concurrent depression leads to improvement of quality of life (Tollefson and Andersen, 1999; Conley et al., 2007).

A predictive effect of global neurocognition on SQOL became apparent only in the multivariable analysis, demonstrating that this effect implied interaction with other variables. In separate analysis (data not shown), we found that this mainly involved the level of depressive symptoms, with participants with both low MMSE and CES-D scores reporting a relatively high SQOL.

With a more modest magnitude, higher observer-based levels of social functioning also predicted a higher SQOL. Social functioning is a multifaceted phenomenon with a variety of interacting factors (e.g., social support, coping style), implicating a complex relationship between social functioning and SQOL. In younger schizophrenia patients, the contribution of social variables to SQOL has been demonstrated (Yanos and Moos, 2007), and psychosocial treatment strategies have reported clear improvements in SQOL (Björkman and Hansson, 2007). In contrast, in late life schizophrenia this area has received little attention (Bartels and Pratt, 2009).

4.3. Strengths and limitations

The clinical relevance of our findings is strengthened by the epidemiological design of the study, as we aimed to recruit all treated patients within a psychiatric catchment area. We included community-living as well as institutionalized patients, and set no restrictions to the age at onset of their disorder. However, our findings only concern patients who were able and willing to consent to participate in this research. Specifically the view of patients with higher symptom levels may have been missed in this respect. The administration of the SQOL instrument in an oral interview may have prompted some participants to answer questions in a socially desirable manner. However, we preferred this method to enhance the reliability of self-report, given the frailty of the population under study. Another limitation of the present study was the use of multiple comparisons, which increased the probability of type 1 errors. However, when the chance of incorrectly producing a difference on an individual test (a type 1 error) is reduced, the chance of making a type 2 error is increased, which implies that no effect or difference is declared, while in fact there is an effect. Therefore, we have not made the Bonferroni correction.

We consider the fact that our final model explained 53% of variance in SQOL as an indication of the robustness of this model. Nevertheless, it also indicates that other factors relating to SQOL have major relevance. Personal coping styles (Cohen et al., 2011) and stigmatization (Depla et al., 2005) are examples of other potentially relevant variables. In a previous publication on this cohort, we reported a substantial correlation between SQOL and the number of unmet needs for care as perceived by the patients (Meesters et al., 2013). However, in the present study we did not include unmet needs as a predictor, as the extensive overlap of the domains measured in SQOL and in the assessment of needs substantially impairs the discriminant validity of these two concepts (Reininghaus and Priebe, 2012).

4.4. Conclusion

Our study indicates that in late life schizophrenia depressed mood and social functioning are among the relevant predictors of SQOL. Depressive symptoms appear to be a more important source of distress than psychotic symptoms, on which treatment traditionally tends to focus. Pharmacological and/or psychosocial treatments for syndromal as well as subsyndromal depression may prove fruitful for improving SQOL among this population (Kasckow et al., 2010). Next, an emerging body of literature suggests that various forms of psychosocial rehabilitation offer promising starting points for targeting SQOL in elderly schizophrenia patients (Bartels and Pratt, 2009). Regarding future research, qualitative study methods can offer a more sophisticated approach to further explore SQOL and its determinants (Shepherd et al., 2012).

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Contributors

All authors participated in the study design, contributed to and approved the final manuscript. Paul D. Meesters collected the subjects, organized the collection of data and wrote the manuscript. Hannie C. Comijs supervised the statistical analyses.

Conflict of interest

Paul D. Meesters has received an unrestricted grant by AstraZeneca.

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References

American Psychiatric Association, 2000. Diagnostic and Statistical Manual of Mental Disorders, 4th ed. American Psychiatric Press, Washington (TR).
Andreasen, N.C., Carpenter Jr., W.T., Kane, J.M., Lasser, R.A., Marder, S.R., Weinberger, D.R., 2005. Remission in schizophrenia: proposed criteria and rationale for consensus. Am. J. Psychiatry 162, 441–449.
Awad, A.G., Voruganti, L.N., 2012. Measuring quality of life in patients with schizophrenia: an update. PharmacoEconomics 30, 183–195.
Bankole, A.O., Cohen, C.I., Vahia, I., Diwan, S., Kehn, M., Ramirez, P.M., 2007. Factors affecting quality of life in a multiracial sample of older persons with schizophrenia. Am. J. Geriatr. Psychiatry 15, 1015–1023.
Bartels, S.J., Pratt, S.I., 2009. Psychosocial rehabilitation and quality of life for older adults with serious mental illness: recent findings and future research directions. Curr. Opin. Psychiatry 22, 381–385.
Beck, A.T., Steer, R.A., 1990. Beck Anxiety Inventory Manual. Psychological Corporation, San Antonio, TX.
Björkman, T., Hansson, L., 2007. Case management for individuals with a severe mental illness: a 6-year follow-up study. Int. J. Soc. Psychiatry 53, 12–22.
Cohen, C.I., Vahia, I., Reyes, P., Diwan, S., Bankole, A.O., Palekar, N., Kehn, M., Ramirez, P., 2008. Focus on geriatric psychiatry: schizophrenia in later life: clinical symptoms and social well-being. Psychiatr. Serv. 59, 232–234.
Cohen, C.I., Hassamal, S.K., Begum, N., 2011. General coping strategies and their impact on quality of life in older adults with schizophrenia. Schizophr. Res. 127, 223–228.
Conley, R.R., Ascher-Svanum, H., Zhu, B., Faries, D.E., Kinon, B.J., 2007. The burden of depressive symptoms in the long-term treatment of patients with schizophrenia. Schizophr. Res. 90, 186–197.
Depla, M.F., De Graaf, R., van Busschbach, J.T., Heeren, T.J., 2003. Community integration of elderly mentally ill persons in psychiatric hospitals and two types of residences. Psychiatr. Serv. 54, 730–735.
Depla, M.F., de Graaf, R., van Weeghel, J., Heeren, T.J., 2005. The role of stigma in the quality of life of older adults with severe mental illness. Int. J. Geriatr. Psychiatry 20, 146–153.
Eack, S.M., Newhill, C.E., 2007. Psychiatric symptoms and quality of life in schizophrenia: a meta-analysis. Schizophr. Bull. 33, 1225–1237.
Folsom, D.P., Depp, C., Palmer, B.W., Mausbach, B.T., Golshan, S., Fellows, I., Cardenas, V., Patterson, T.L., Kraemer, H.C., Jeste, D.V., 2009. Physical and mental health-related quality of life among older people with schizophrenia. Schizophr. Res. 108, 207–213.
Folstein, M.F., Folstein, S.E., McHugh, P.R., 1975. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J. Psychiatr. Res. 12, 189–198.
Franz, M., Meyer, T., Reber, T., Gallhofer, B., 2000. The importance of social comparisons for high levels of subjective quality of life in chronic schizophrenic patients. Qual. Life Res. 9, 481–489.
Jin, H., Zisook, S., Palmer, B.W., Patterson, T.L., Heaton, R.K., Jeste, D.V., 2001. Association of depressive symptoms with worse functioning in schizophrenia: a study in older outpatients. J. Clin. Psychiatry 62, 797–803.
Kasckow, J., Lanouette, N., Patterson, T., Fellows, I., Golshan, S., Solorzano, E., Zisook, S., 2010. Treatment of subsyndromal depressive symptoms in middle-aged and older adult with schizophrenia: effect on functioning. Int. J. Geriatr. Psychiatry 25, 183–190.
Katschnig, H., 2000. Schizophrenia and quality of life. Acta Psychiatr. Scand. Suppl. 407, 33–37.
Kay, S.R., Fiszbein, A., Opler, L.A., 1987. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr. Bull. 13, 261–276.
Maat, A., Fett, A.K., Derks, E., GROUP Investigators, 2012. Social cognition and quality of life in schizophrenia. Schizophr. Res. 137, 212–218.

Meesters, P.D., Comijs, H.C., de Haan, L., Smit, J.H., Eikelenboom, P., Beekman, A.T., Stek, M.L., 2011. Symptomatic remission and associated factors in a catchment area based population of older patients with schizophrenia. Schizophr. Res. 126, 237–244.
Meesters, P.D., de Haan, L., Comijs, H.C., Stek, M.L., Smeets-Janssen, M.M., Weeda, M.R., Eikelenboom, P., Smit, J.H., Beekman, A.T., 2012. Schizophrenia spectrum disorders in later life: prevalence and distribution of age at onset and sex in a Dutch catchment area. Am. J. Geriatr. Psychiatry 20, 18–28.
Meesters, P.D., Comijs, H.C., Dröes, R.M., de Haan, L., Smit, J.H., Eikelenboom, P., Beekman, A.T., Stek, M.L., 2013. The care needs of elderly patients with schizophrenia spectrum disorders. Am. J. Geriatr. Psychiatry 21, 129–137.
Mittal, D., Davis, C.E., Depp, C., Pyne, J.M., Golshan, S., Patterson, T.L., Jeste, D.V., 2006. Correlates of health-related quality of well-being in older patients with schizophrenia. J. Nerv. Ment. Dis. 194, 335–340.
Oliver, J.P., Huxley, P.J., Priebe, S., Kaiser, W., 1997. Measuring the quality of life of severely mentally ill people using the Lancashire quality of life profile. Soc. Psychiatry Psychiatr. Epidemiol. 32, 76–83.
Priebe, S., 2007. Social outcomes in schizophrenia. Br. J. Psychiatry Suppl. 50, s15–s20.
Priebe, S., Huxley, P., Knight, S., Evans, S., 1999. Application and results of the Manchester Short Assessment of Quality of Life (MANSA). Int. J. Soc. Psychiatry 45, 7–12.
Priebe, S., Reininghaus, U., McCabe, R., Burns, T., Eklund, M., Hansson, L., Junghan, U., Kallert, T., van Nieuwenhuizen, C., Ruggeri, M., Slade, M., Wang, D., 2010. Factors influencing subjective quality of life in patients with schizophrenia and other mental disorders: a pooled analysis. Schizophr. Res. 121, 251–258.
Radloff, L.S., 1977. The CES-D scale: a self-report depression scale for research in the general population. Appl. Psychol. Meas. 1, 385–401.
Reininghaus, U., Priebe, S., 2012. Measuring patient-reported outcomes in psychosis: conceptual and methodological review. Br. J. Psychiatry 201, 262–267.
Ritsner, M.S., Arbitman, M., Lisker, A., Ponizovsky, A.M., 2012. Ten-year quality of life outcomes among patients with schizophrenia and schizoaffective disorder II. Predictive value of psychosocial factors. Qual. Life Res. 21, 1075–1084.
Sheehan, D.V., Lecrubier, Y., Sheehan, K.H., Amorim, P., Janavs, J., Weiller, E., Hergueta, T., Baker, R., Dunbar, G.C., 1998. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J. Clin. Psychiatry 59 (Suppl. 20), 22–33.
Shepherd, S., Depp, C.A., Harris, G., Halpain, M., Palinkas, L.A., Jeste, D.V., 2012. Perspectives on schizophrenia over the lifespan: a qualitative study. Schizophr. Bull. 38, 295–303.
Slade, M., Leese, M., Cahill, S., Thornicroft, G., Kuipers, E., 2005. Patient-rated mental health needs and quality of life improvement. Br. J. Psychiatry 187, 256–261.
Tollefson, G.D., Andersen, S.W., 1999. Should we consider mood disturbance in schizophrenia as an important determinant of quality-of-life? J. Clin. Psychiatry 60 (Suppl. 5), 23–29.
Tolman, A.W., Kurtz, M.M., 2012. Neurocognitive predictors of objective and subjective quality of life in individuals with schizophrenia: a meta-analytic investigation. Schizophr. Bull. 38, 304–315.
Voruganti, L., Heslegrave, R., Awad, A.G., Seeman, M.V., 1998. Quality of life measurement in schizophrenia: reconciling the quest for subjectivity with the question of reliability. Psychol. Med. 28, 165–172.
Yanos, P.T., Moos, R.H., 2007. Determinants of functioning and well-being among individuals with schizophrenia: an integrated model. Clin. Psychol. Rev. 27, 58–77.