Soc Psychiatry Psychiatr Epidemiol (2013) 48:303–311
DOI 10.1007/s00127-012-0545-2

ORIGINAL PAPER

Psychosocial outcome in patients at clinical high risk of psychosis: a prospective follow-up

Raimo K. R. Salokangas · Dorien H. Nieman · Markus Heinimaa · Tanja Svirskis · Sinikka Luutonen · Tiina From · Heinrich Graf von Reventlow · Georg Juckel · Don Linszen · Peter Dingemans · Max Birchwood · Paul Patterson · Frauke Schultze-Lutter · Joachim Klosterkötter · Stephan Ruhrmann · The EPOS group

Received: 30 March 2012 / Accepted: 18 June 2012 / Published online: 15 July 2012
© Springer-Verlag 2012

Abstract
Purpose In patients at clinical high risk (CHR) of psychosis, transition to psychosis has been the focus of recent studies. Their broader outcome has received less attention. We studied psychosocial state and outcome in CHR patients.
Methods In the European Prediction of Psychosis Study, 244 young help-seeking CHR patients were assessed with the Strauss and Carpenter Prognostic Scale (SCPS) at baseline, and 149 (61.1 %) of them were assessed for the second time at the 18-month follow-up. The followed patients were classified into poor and good outcome groups.
Results Female gender, ever-married/cohabitating relationship, and good working/studying situation were associated with good baseline SCPS scores. During follow-up, patients' SCPS scores improved significantly. Good follow-up SCPS scores were predicted by higher level of education, good working/studying status at baseline, and white ethnicity. One-third of the followed CHR patients

R. K. R. Salokangas (✉) · M. Heinimaa · S. Luutonen · T. From
Department of Psychiatry, University of Turku, 20520 Turku, Finland
e-mail: Raimo.K.R.Salokangas@tyks.fi

R. K. R. Salokangas · S. Luutonen
Psychiatric Clinic, Turku University Central Hospital, Turku, Finland

R. K. R. Salokangas
Turku Psychiatric Clinic, Turku Mental Health Centre, Turku, Finland

D. H. Nieman · D. Linszen
Academic Medical Centre, University of Amsterdam, Amsterdam, Netherlands

T. Svirskis
Department of Psychiatry, University of Helsinki, Helsinki, Finland

T. Svirskis
Peijas Hospital, Helsinki University Central Hospital, Helsinki, Finland

H. G. von Reventlow · G. Juckel
Department of Psychiatry, Ruhr-University Bochum, LWL University Hospital, Bochum, Germany

D. Linszen
Department of Psychiatry and Psychology, University of Maastricht, Maastricht, Netherlands

P. Dingemans
Academic Medical Centre, University of Amsterdam, Amsterdam, Netherlands

P. Dingemans
Mediant, Enschede, Netherlands

M. Birchwood
School of Psychology, University of Birmingham, Birmingham, UK

P. Patterson
Youthspace, Birmingham and Solihull Mental Health Foundation Trust, Birmingham, UK

F. Schultze-Lutter
University Hospital of Child and Adolescent Psychiatry, University of Bern, Bern, Switzerland

J. Klosterkötter · S. Ruhrmann
Department of Psychiatry and Psychotherapy, University of Cologne, Cologne, Germany

had poor global outcome. Poor working/studying situation and lower level of education were associated with poor global outcome. Transition to psychosis was associated with baseline, but not with follow-up SCPS scores or with global outcome.

Conclusion The majority of CHR patients experience good short-term recovery, but one-third have poor psychosocial outcome. Good working situation is the major indicator of good outcome, while low level of education and non-white ethnicity seem to be associated with poor outcome. Transition to psychosis has little effect on psychosocial outcome in CHR patients. In treating CHR patients, clinicians should focus their attention on a broader outcome, and not only on preventing transition to psychosis.

Keywords Clinical high-risk patients · Straus and Carpenter Prognostic Scale · Prospective follow-up · Psychosocial outcome

Introduction

Patients at risk of psychosis have been the focus of intensive scientific and clinical research. Instruments for detecting patients at high risk of psychosis [1, 2] and predictive models for transition to psychosis have been developed [3, 4]. According to follow-up studies, the rate of transition to psychosis in high-risk patients varies between 9 and 54 % with a decreasing time trend in the 2000s [5]. In two recent follow-up studies, transition rates were 35 % in 2½ years [3] and 19 % in 18 months [4].

In addition to transition to psychosis, patient's psychosocial state is an important outcome criterion. It includes both clinical and social aspects and offers a broader approach to outcome in clinical high-risk (CHR) patients. To ascertain psychosocial prognosis and the subsequent outcome in schizophrenia, Strauss and Carpenter developed the Strauss and Carpenter Prognostic Scale (SCPS) [6–9]. In these studies, SCPS and certain of its items proved to be powerful predictors of outcome and useful for assessment of psychosocial outcome.

In the multi-centre naturalistic European Prediction of Psychosis Study (EPOS), a large number of young CHR patients were extensively examined and prospectively followed for 18 months [10]. All patients received treatment according to the local treatment standard. In the present study, our aim was to investigate (a) psychosocial baseline state and follow-up outcome in CHR patients, (b) factors associated with baseline situation and outcome, and (c) the proportion of CHR patients with good or poor global psychosocial outcome.

Subjects and methods

The investigation was carried out in accordance with the latest version of the Declaration of Helsinki. Local ethics committees of the participating universities or health-care agencies approved the study. Written informed consent was obtained from all participants and their parents if minors.

Design and study subjects

The EPOS project is a prospective follow-up study of 245 high-risk patients recruited between August 2002 and April 2006 in six centres: Cologne and Berlin in Germany, Turku in Finland, Amsterdam in the Netherlands, and Birmingham and Manchester in the UK [4, 10].

Inclusion criteria of the EPOS project comprised cognitive disturbances (COGDIS) assessed by the 'Bonn Scale for the Assessment of Basic Symptoms' [11] and ultra-high-risk criteria: attenuated psychotic symptoms (APS), brief limited psychotic symptoms (BLIPS), and genetic risk and reduction of function (GR-RF) assessed by the 'Structured Interview for Prodromal Syndromes' [2]. Exclusion criteria were: a psychotic episode for more than 1 week, i.e. fulfilling DSM-IV criteria of a brief psychotic episode not only for 2 but for at least 7 days, as assessed with SCID-I [12]; symptoms relevant for inclusion arising from a known general medical disorder or drugs or alcohol dependency; low verbal IQ (<85).

Clinical assessments

The baseline examination included socio-demographic information and extensive clinical assessments [4, 10]. The baseline global psychosocial situation and outcome were assessed by the Strauss and Carpenter Prognostic Scale (SCPS) [8]. SCPS encompasses 21 items comprising information on the patient's social situation (S), history (H), and psychiatric state (P): (1A) quantity and (1B) quality of useful work in the past year (S); (2) social class; (3A) number and (3B) quality of social relationships (S, H); (4) heterosexual relationships; (5) treatment facilities used currently (P); (6) family history of psychiatric symptoms (H); (7) earliest onset of any psychiatric symptoms (H); (8) action problems since the age of 12 years (H); (9) flattened, diminished expression of feeling or emotion in the past month (P, H); (10) duration of previous hospitalisations (P, H); (11A) length of time since first occurrence of hallucinations or delusions (H), (11B) longest period of severe (H) and (11C) any (H) psychiatric problems; (12) presence of thought disorder, delusions or hallucinations in the past year (P, H); (13) presence of depression, hypomania or mania in the past year (P, H); (14) precipitating events for most recent psychiatric upset

(H); (15) reported severity of subjective distress in the past month (P); (16) most usual ability to meet own basic needs in the past year (P, H); and (17) most usual fullness of life (S, H) [6–8, 13]. Fullness of life is a global assessment of how actively an individual is involved in various activities with gratification.

Wherever appropriate, the temporal reference for functioning is the year prior to evaluation. Each item was rated by the interviewer on a 5-point severity scale from 0 (poor prognosis/state) to 4 (favourable prognosis/state). The validity of the instrument has been tested in several studies of schizophrenia patients and has shown acceptable internal consistency, test–retest reliability, and convergent validity [14]. At baseline, SCPS was available from 244 patients.

Follow-up

According to the study protocol, follow-up assessments took place at 9 and 18 months from baseline. Because the main goal of the EPOS study was to detect transitions to psychosis among CHR patients, all patients with this transition were not followed for 18 months (mean follow-up time 14.2 months [from 0 to 18 months]). Therefore, and because of dropouts, at 18-month follow-up, SCPS was available from 149 or 61.1 % of the 244 patients who had been examined by SCPS at baseline. There were no statistical differences in socio-demographic variables and baseline SCPS sum scores (see Table 1) between the patients with or without follow-up SCPS sum scores.

Transition to psychosis was operationalised as a continuation of BLIPS, one or more psychotic symptoms persisting for a time period longer than 1 week. During the 18-month follow-up, 37 transitions to psychosis were identified. SCPS was available from 13 patients with and 136 without transition to psychosis. Study design, methods, and clinical assessment of the patients are described in more detail in previous articles [4, 10].

Statistical analyses

Our aim was to study the psychosocial state and outcome with SCPS. Therefore, we omitted pure H SCPS items from the analyses. As outdated items, social class and heterosexual relationship were also omitted. All 12 S and/or P SCPS items were selected for reliability analyses. Their missing items (less than 4 %) were estimated by using information from other instruments. In reliability analyses, Cronbach's alpha (0.610) was calculated for these 12 baseline items. Thereafter, items were omitted one by one from the reliability analysis until Cronbach's alpha (0.751) no longer increased. The omitted four items were: (5) treatment facilities used currently, (10) duration of previous hospitalisations, (12) presence of thought disorder, delusions or hallucinations in the past year, and (15) reported severity of subjective distress in the past month. The study subjects had very few hospitalisations (5 and 10) and no clear psychotic symptoms (12). In the case of "subjective distress", the item-total correlation was negative and reduced the Cronbach's alpha most. The remaining eight SCPS items (1A, 1B, 3A, 3B, 9, 13, 16, 17) were selected for further analyses.

Two SCPS sum scores were calculated. The first sum score (from 0 [poorest] to 32 [best]) included the eight selected baseline items (BLSC8), and the second one (from 0 to 32) the same eight follow-up items (FOSC8). In ANOVA, variance in BLSC8 was explained by all socio-demographic variables (Table 1), and variance in FOSC8 by socio-demographic variables alone and when the effect of baseline BLSC8 was controlled for. Differences between BLSC8 and FOSC8 scores were tested by paired-sample t test, and Pearson correlation was calculated between BLSC8 and FOSC8.

BLSC8 and FOSC8 were analysed in cluster analysis (two-cluster solution), and the difference between these two clusters was explained by all socio-demographic variables and by SCPS items in stepwise logistic regression analysis. Transition to psychosis was cross-tabulated with clusters and tested by χ^2 test. Statistical analyses were performed using SPSS (version 19.0) for Windows. P values below 0.05 (two tailed) were considered statistically significant. However, some non-significant associations are also reported.

Results

SCPS sum scores

SCPS sum score distributions are presented in Fig. 1. FOSC8 was significantly greater (t −4.963, df 148, $p < 0.001$) than BLSC8, indicating that the patients' psychosocial state improved during the 18-month follow-up (mean 2.2, SD 5.4, range 14–20). However, correlation between BLSC8 and FOSC8 was high ($r = 0.556$; $p < 0.001$).

Socio-demographic background and SCPS sum scores

The socio-demographic characteristics of the EPOS sample are shown in Table 1. The EPOS subjects were young (mean age 22.4 years) and a majority of them were single, lived with their parents, and in a highly populated area. Men were slightly over-represented, and less often, not significantly, married/cohabitating (14.5 %) than women

Table 1 Socio-demographic background of the study subjects and their baseline (BLSC8) and follow-up (FOSC8) sum scores

	BLSC8					FOSC8				
	n	%	Mean	SD	*p*	*n*	%	Mean	SD	*p*
All	244	100	21.8	5.4		149	100	23.8	5.9	
Gender					0.046					0.379
Men	137	56.1	21.2	5.6		77	51.7	24.2	5.5	
Women	107	43.9	22.6	5.1		72	48.3	23.4	6.4	
Age					0.828					0.565
<17	39	15.9	22.4	4.9		25	16.8	23.8	6.3	
18–20	76	31.0	21.9	5.9		48	32.3	22.6	6.6	
21–25	65	26.5	21.7	4.9		39	26.2	25.6	4.4	
>26	65	26.5	21.4	5.8		37	24.8	23.6	5.9	
Marital status					0.023					0.565
Single	198	81.1	21.4	5.4		122	81.9	23.7	5.9	
Ever married/cohabiting	46	18.9	23.4	5.2		27	18.1	24.4	6.0	
Living situation					0.354					0.750
Alone	59	24.2	21.6	5.4		34	22.8	24.5	5.2	
With partner	29	11.9	23.4	5.6		18	12.1	24.3	6.7	
With parents	123	50.4	21.4	5.6		79	53.0	23.3	6.3	
Other	33	13.5	21.9	4.7		18	12.1	24.3	4.6	
Education years					0.167					0.042
>15	63	25.8	22.6	5.1		40	26.8	25.8	4.4	
12–14	130	53.3	21.2	5.5		82	55.0	23.0	6.2	
<11	51	20.9	22.4	5.5		27	18.1	23.4	6.7	
Work situation					<0.001					<0.001
Full- or part-time work or education	164	67.2	23.5	4.3		98	65.8	25.3	4.7	
Unemployed	37	15.2	19.4	5.5		26	17.4	22.6	5.8	
Unable to work (sickness/disability)	43	17.6	17.1	5.5		25	16.8	19.3	7.7	
Ethnic group					0.392					0.132
White	204	83.6	21.9	5.4		124	83.2	24.2	6.1	
Afro-Caribbean/African/Asian/other	40	16.4	21.1	5.8		25	16.8	22.2	4.8	
Followed					0.657					
Yes	149	61.1	22.0	5.5						
No	95	38.9	21.7	5.4						

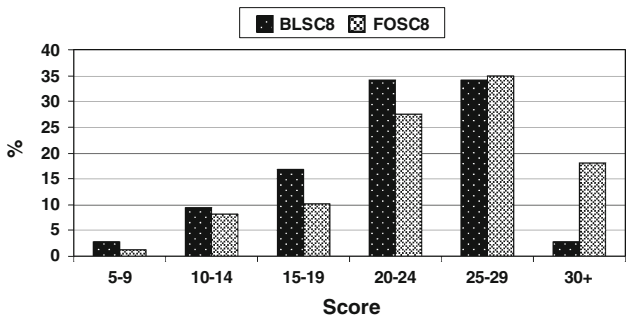

Fig. 1 SCPS sum score distributions (BLSC8 = baseline, FOSC8 = follow-up)

(24.3 %, $p = 0.069$). About two-thirds of the patients were working or studying full-time. Less than one-fifth were non-white.

Table 1 also shows SCPS sum scores at baseline and follow-up. At baseline, men and singles had lower BLSC8 scores than women and ever-married/cohabiting patients. On the other hand, working or studying patients had higher BLSC8 scores compared with others. In BLSC8 scores, there was no difference by socio-demographic variables between the followed and non-followed patients.

Of the baseline socio-demographic variables, only education years and work situation were significantly associated with FOSC8. The patients working/studying and those with a higher level of education had higher FOSC8 than others.

For analysing changes between baseline and follow-up state, we subtracted BLSC8 from FOSC8. A positive (FOSC8 minus BLSC8) score means improvement in

psychosocial state. Men experienced more improvement than women (mean/SD 3.2/5.7 vs. 1.0/4.8, $p = 0.012$) and subjects older than 21 years more improvement than younger ones (mean/SD 3.3/4.7 vs. 1.0/5.8, $p = 0.008$). Additionally, white patients experienced improvement, while patients with a non-white ethnic origin showed no improvement at all (mean/SD 2.7/5.2 vs. –0.8/5.5, $p = 0.002$).

Predictive models

In multivariate ANOVA, BLCP8 was explained by ever-married/cohabitating situation and good work situation at baseline, and FOSC8 by higher level of education, good work situation at baseline, and white ethnicity (Table 2). When the effect of BLSC8 was controlled for, only ethnicity ($p = 0.006$) had a significant association with FOSC8.

Because both BLSC8 and FOSC8 include two work items (1A. quantity and 1B. quality of useful work in the past year), we recalculated these models with the dependent variables BLSC6 and FOSC6 from which these two items were omitted. In the first model, baseline work situation was associated significantly ($p < 0.001$), but marital status only non-significantly ($p = 0.071$) with BLSC6. In the second model, baseline work situation ($p < 0.001$), education years ($p = 0.047$), and ethnicity ($p = 0.007$) significantly predicted FOSC6. When the effect of BLSC6 was controlled for in the second model, ethnicity ($p = 0.005$) still had a significant association with FOSC6.

Table 2 Explanation of variance of baseline (BLSC8) and follow-up (FOSC8) SCPS sum scores by socio-demographic background variables in ANOVA (Figures for significant associations only)

	BLSC8		FOSC8	
	p	CI 95 %	*p*	CI 95 %
Gender				
Men				
Women				
Marital status				
Ever married/cohabiting	0.022	0.256–3.314		
Single		1		
Education years			0.040	
>15			0.062	−0.124–5.518
12–14			0.982	−2.390–2.335
<11				1
Work situation	<0.001		<0.001	
Full- or part-time work or education	<0.001	4.831–8.027	<0.001	4.064–8.853
Unemployed	0.028	0.257–4.442	0.012	0.836–6.782
Unable to work (sickness/disability)		1		1
Ethnic group				
White			0.016	0.544–5.273
Afro-Caribbean/African/Asian/other				1

Global outcome

In cluster analysis of BLSC8 and FOSC8, two clusters were formed and named: poor ($n = 53$, 35.6 %) and good ($n = 96$, 64.4 %) global outcome. SCPS sum scores (means/SD) for good global outcome were 24.5/3.4 (BLSC8) and for poor global outcome 16.5/4.7 ($p < 0.001$). For FOSC8, the corresponding figures were 27.2/3.2 and 17.7/4.7 ($p < 0.001$). It is worth noting that in the poor global outcome group, BLSC8 and FOSC8 were almost identical (t −1.339, df 52, $p = 0.186$), indicating no clear recovery in this group, while in the good global outcome group, there were clear (t −5.818, df 95, $p < 0.001$) increases in SCPS scores.

As expected, global outcome associated highly significantly ($p < 0.001$) with all SCPS items. In stepwise logistic regression analysis, items 1a (quantity of useful work), 3a (number of social relations), 9 (flattened diminished expression of feeling or emotion), and 17 (most usual fullness of life) entered into the model (Table 3).

Of the baseline variables, work situation associated strongly with global outcome. Nearly three-fourths (72.0 %) of the patients unable to work, 50 7 % of the unemployed, and 22.4 % of working/studying patients belonged to the poor global outcome group. In the logistic regression model, poor work situation and low level of education at baseline were associated with poor global outcome (Table 4).

Transition to psychosis

BLSC8 was lower in the 13 patients who later experienced transition to psychosis than in the 136 patients without transition to psychosis (mean/SD 17.8/5.9 vs. 22.5/5.0,

Table 3 Stepwise logistic regression of global outcome by BLSC8

SCPS items	*p*	OR	CI 95 %
1a. Quantity of useful work	<0.001	2.059	1.405–3.016
3a. Number of social relations	<0.001	2.540	1.556–4.147
9. Flattened diminished expression of feeling or emotion	<0.001	2.729	1.555–4.790
17. Most usual fullness of life	0.004	3.269	1.465–7.292

Table 4 Stepwise logistic regression of global outcome by socio-demographic data

	p	OR	CI 95 %
Education years	0.055		
>15	0.059	3.205	0.955–10.756
12–14	0.948	0.968	0.369–2.511
<11		1	
Work situation	<0.001		
Full- or part-time work or education	<0.001	10.095	3.552–28.691
Unemployed	0.072	3.054	0.905–10.307
Unable to work (sickness/disability)		1	

$p < 0.001$). However, there was no significant difference in FOSC8 between those with transition or non-transition to psychosis during the 18-month follow-up (mean/SD 22.5/6.0 vs. 24.0/5.9, $p = 0.385$). Seven (13.0 %) of the patients with poor and six (6.3 %) with good global outcome (Fisher exact test $p = 0.224$) had a transition to psychosis.

Discussion

To our knowledge, this is the first study using the Strauss Carpenter Prognostic Scale for the prediction of psychosocial outcome in CHR patients. The SCPS has been widely used in studying the prediction of outcome in schizophrenia [6–8, 13, 15]. In a recent study of schizophrenia and schizophrenia spectrum disorders, SCPS was found to be a valuable tool to detect early improvers already at the initiation of antipsychotic treatment [16]. This study extends the applicability of the SCPS to the study of a broader psychosocial outcome in CHR patients.

Work and education

Of the baseline factors, working situation, including studying, was a strong predictor of short-term psychosocial outcome in CHR patients. The majority of the patients who were unemployed or unable to work belonged to the poor global outcome group. It is important to note that the baseline work situation remained a significant predictor even when the items related to work were subtracted from the follow-up outcome indicator. In addition to work situation, the number of education years was associated with short-term outcome.

Work situation or ability to work predict short- and long-term outcome in first-episode schizophrenia [17–20], while work, indicated by ability to work, work skills, paid work, work history, etc., is a key question in instruments used for predicting and measuring outcome in psychoses [21, 22]. In the present, non-psychotic patient sample, work situation proved to be an equally important predictor as in psychotic patients who may have lost their job or working ability due to rather severe symptoms preceding the first admission.

It is possible that in our CHR patients, becoming unemployed or unable to work and possibly interrupted education were partially caused by early non-psychotic or prodromal symptoms not yet leading to help seeking. Thus, the CHR patients, as well as first-episode patients with psychosis [23], who are unemployed or unable to work, require special attention and vigorous rehabilitation measures to improve their psychosocial outcome. It is expected that in CHR patients, active vocational rehabilitative interventions could be at least as effective as in psychotic and more chronic patients [24–26]. Vocational support seems to be important also for adolescents after an episode of psychotic mood disorder [27].

Gender and marital status

At baseline, males' psychosocial situation was poorer than that of females, but at follow-up there was no longer any gender difference in psychosocial outcome. There was also no gender difference in global outcome. Single patients also had a poorer baseline psychosocial situation, but as in the case of gender, at follow-up there was no longer any difference between single and ever-married/cohabitating patients.

The results of the present study differ slightly from those obtained in studies on patients with schizophrenia. In several first-episode studies, males and singles with schizophrenia had poorer outcome than females and ever married [e.g. 17, 18, 28–33]. In a large sample of subjects with various psychotic disorders, within each diagnostic group, women reported better premorbid functioning, a more benign illness course, lower levels of disability, and better integration into the community than men. They were also less likely to have a chronic course of illness. Greater social integration and functioning in women across diagnostic groups may well reflect culturally and socially determined gender differences [34].

These outcome differences between first-episode schizophrenia and CHR patients are probably explained by the age of samples and gender differences in seeking help. For the EPOS study, we recruited young patients, mean age 22 years, and therefore also the gender difference in marital/cohabitating status remained smaller, although it was in the direction that females had formed an intimate relationship more often than males. Usually, young males seek help less actively than females [35]. Thus, it is possible that also in this EPOS sample, due to delayed help seeking, males—often single—were more disturbed than females at baseline examination. Thereafter, they recovered so well

that at follow-up their psychosocial situation was equal to that of females. This finding indicates that early intervention, carried out during the clinical prodromal phase, can improve the delayed psychosocial development of young CHR men and probably prevent them from falling behind females' psychosocial development. The gender difference in seeking help can also explain the non-existing marital outcome difference at follow-up. In older samples with schizophrenia, men and singles had more time to fall behind in psychosocial development and, therefore, their outcome also remained poorer than that of females [36]. After psychosis, even an intensive psychosocial treatment programme seems not to improve social network in first-episode schizophrenic disorders [37].

Ethnicity

An important finding concerned ethnicity and outcome. In baseline SCPS scores, there were no significant differences between ethnic groups, but during follow-up, psychosocial recovery was clearly better in white than in non-white subjects, who did not experience any improvement and, at follow-up, had a poorer outcome when the effects of baseline education and working situation were taken into account. Possibly because of the small number of non-white subjects, ethnicity was not associated with global outcome in univariate analysis. However, in modelling, when the effect of other variables was taken into account, being non-white increased the risk of poor global outcome. Additionally, positive recovery of psychosocial situation was clearly poorer in non-white than in white subjects.

Several studies have found high psychosis rates in ethnic minorities, in particular among Afro-Caribbean and other Black immigrants [38]. The excess of psychosis appears to be partly explained by their socioeconomic disadvantage [39]. Their psychosocial outcome also seems to be poorer than that of the original population. In studies with schizophrenia patients compared with white patients, black patients had a poorer outcome in terms of readmissions [40], and African American patients had a slower rate of improvement in social functioning [41]. The results of the present study, together with earlier studies on different patient samples, emphasises the fact that people of minor ethnic groups need special attention and interventions tailored to their special needs for improving their life in general and their psychosocial outcome specifically.

Global outcome

Statistically expressed, one-third of CHR patients have a poor global psychosocial outcome. Their global state was rather poor already at baseline, and during a short-term follow-up did not improve significantly. Of the baseline socio-demographic data, poor working status and low level of education at baseline were the major indicators of this poor global outcome group. On the other hand, the baseline SCPS items describing quantity of useful work, number of social relationships, flattened affects and fullness of life entered into the global outcome model. Both these findings, obtained in different statistical modelling, emphasise the need for comprehensive rehabilitating interventions comprising measures improving working and social relations and negative symptoms.

Transition to psychosis and psychosocial outcome

In the present study, the association between psychosocial outcome, indicated by follow-up SCPS scores and global outcome, and transition to psychosis remained weak. This result is in line with those of patients with schizophrenia: the outcome consists of several semi-independent processes best conceptualised as open-linked systems [6, 7]. According to this system theory, for example, the causes behind poor work or social functioning may be quite different from the causes of symptomatology. Therefore, focused treatment for each of several systems of function may be required [6]. In this multi-dimensional outcome system, psychotic positive symptoms seem to play a minor role. In first-episode schizophrenia patients, contrary to negative symptoms, positive symptoms did not associate with outcome defined as the maintenance of grip on life and goals of life [42]. More recently, Schennach-Wolff et al. [16] found that in schizophrenia and schizophrenia spectrum patients, amongst others, a higher PANSS positive sub-score was a significant predictor of early improvement defined as a $\geq$30 % PANSS total score reduction within the first two treatment weeks. In a sample of CHR subjects, lower levels of negative and mood/anxiety symptoms were related to increased likelihood of both symptomatic and functional recovery. Psychosocial functioning was a robust predictor of clinical outcome, and there was no great difference between the patients who converted and those who did not convert to psychosis [43].

In CHR patients, positive psychotic-like (sub-threshold) symptoms predict transition to psychosis [3, 4]. It is, thus, understandable that transition to psychosis, factors predicting these transitions, and interventions for preventing transition to psychosis in CHR patients have been the focus of recent clinical research. However, transition to psychosis is not the only, and not even the major aspect of outcome in CHR patients. Help-seeking individuals meeting CHP criteria suffer from multiple psychosocial problems which they need to be treated for [44–46]. We need a broader approach both in research and interventions for improving the life of CHR patients.

Limitations

Because of the study design, we were able to follow only 61 % of the original sample. The EPOS was planned to detect transitions to psychosis of CHR patients and, in a number of cases, patients were not followed after transition to psychosis. Additional dropouts also decreased the number of patients examined at 18 months. However, there were no significant differences in socio-demographic variables and baseline SCPS sum scores. Thus, to a certain extent, the findings of the follow-up can be generalised to the whole CHR sample.

The SCPS is developed for predicting and describing outcome in patients with schizophrenia [6, 7]. Therefore, some of its 12 items which were originally selected seemed not to be suitable for studying psychosocial state and outcome in CHR patients. For example, very few CHR patients had been hospitalised before baseline and during the follow-up period. For the same reason, the researchers also had difficulties assessing "the longest period of severe psychiatric problems". Therefore, the number of items was reduced by using reliability analysis, and the sum of the eight items which did not reduce Cronbach's alpha was accepted to describe the subjects' psychosocial state and outcome. Despite these structural limitations, the SCPS has proved to be feasible for predicting and describing psychosocial outcome in CHR patients.

Acknowledgments This study was funded by the grant QLG4-CT-2001-01081 from the 5th Framework Program Quality of Life and Management of Living Resources of the European Commission. Additional local funding was provided by the Social Insurance Institution of Finland and the Medical Faculty of Cologne (Köln Fortune Program). Professor Birchwood and Dr Patterson were part funded by the National Institute for Health Research (NIHR) through the Collaborations for Leadership in Applied Health Research and Care for Birmingham and Black Country (CLAHRC-BBC)'.

Conflict of interest None.

References

1. Yung AR, McGorry PD (1996) The prodromal phase of first-episode psychosis: past and current conceptualizations. Schizophr Bull 22:353–370
2. McGlashan TH, Miller TJ, Woods SW et al. (2001) Structured interview for prodromal syndromes (Version 3.0, unpublished manuscript): PRIME Research Clinic, Yale School of Medicine, New Haven
3. Cannon TD, Cadenhead K, Cornblatt B, Woods SW, Addington J, Walker E, Seidman LJ, Perkins D, Tsuang M, McGlashan T, Heinssen R (2008) Prediction of psychosis in youth at high clinical risk: a multisite longitudinal study in North America. Arch Gen Psychiatry 65:28–37
4. Ruhrmann S, Schultze-Lutter F, Salokangas RKR, Heinimaa M, Linszen D, Dingemans P, Birchwood M, Patterson P, Juckel G, Heinz A, Morrison A, Lewis S, Graf von Reventlow H, Klosterkötter J (2010) Prediction of Psychosis in Adolescents and Young Adults at high risk: Results from the Prospective European Prediction of Psychosis Study. Arch Gen Psychiatry 67:241–251
5. Yung AR, Yuen HP, Berger G, Francey S, Hung TC, Nelson B, Phillips L, McGorry P (2007) Declining transition rate in ultra high risk (prodromal) services: dilution or reduction of risk? Schizophr Bull 33:673–681
6. Strauss JR, Carpenter WT (1974) The prediction of outcome in schizophrenia. II. Relationships between predictor and outcome variables. Arch Gen Psychiatry 31:37–42
7. Strauss JS, Carpenter WT Jr (1977) Prediction of outcome in schizophrenia III: five-year outcome and its predictors. Arch Gen Psychiatry 34:159–163
8. Carpenter WT Jr, Strauss JS (1991) The prediction of outcome in schizophrenia IV: eleven-year follow-up of the Washington IPSS cohort. J Nerv Ment Dis 179:517–525
9. Poirier S, Bureau V, Lehoux C, Bouchard RH, Maziade M, Pelletier S, René L, Trépanier J, Emond C, Mérette C, Roy MA (2004) A factor analysis of the Strauss and Carpenter revised outcome criteria scale: a validation of the French translation. J Nerv Ment Dis 192:864–867
10. Klosterkötter J, Ruhrmann S, Schultze-Lutter F, Salokangas RKR, Linszen D, Birchwood M, Juckel G, Morrison A, Vázquèz-Barquero, Hambrecht M, von Reventlow H, on behalf of the EPOS group (2005) The European Prediction of Psychosis Study (EPOS): integrating early recognition and intervention in Europe. World Psychiatry 4:161–167
11. Schultze-Lutter F, Klosterkötter J (2002) Bonn Scale for Assessment of Basic Symptoms–Prediction List, BSABS-P. University of Cologne, Cologne
12. First MB, Spitzer RL, Gibbon M, Williams JBW (1997) Structured clinical interview for DSM-IV axis I disorders (SCID-I). American Psychiatric Publishing, Arlington
13. Kokes RF, Strauss JS, Klorman R (1977) Premorbid adjustment in schizophrenia. Part II: measuring premorbid adjustment: the instruments and their development. Schizophr Bull 3:186–213
14. Händel M, Bailer J, Bräuer W, Laubenstein D, Rey ER (1996) The prognostic scale by Strauss and Carpenter and its validity. Eur Arch Psychiatry Clin Neurosci 246:203–208
15. Wieselgren IM, Lindstrom LH (1996) A prospective 1–5 year outcome study in first-admitted and readmitted schizophrenic patients; relationship to heredity, premorbid adjustment, duration of disease and education level at index admission and neuroleptic treatment. Acta Psychiatr Scand 93:9–19
16. Schennach-Wolff R, Meyer S, Seemüller F, Jäger M, Schmauss M, Laux G, Pfeiffer H, Naber D, Schmidt LG, Gaebel W, Klosterkötter J, Heuser I, Maier W, Lemke MR, Rüther E, Klingberg S, Gastpar M, Möller HJ, Riedel M (2011) Influencing factors and predictors of early improvement in the acute treatment of schizophrenia and schizophrenia spectrum disorder. J Psychiatr Res 45:1639–1647
17. Salokangas RKR (1978) Psychosocial prognosis in schizophrenia. Formation of the prognosis for schizophrenic patients: a multivariate analysis. Annales Universitatis Turkuensis. Ser. D. University of Turku, Turku
18. Salokangas RKR (1983) Prognostic implications of the sex of schizophrenic patients. Br J Psychiatry 142:145–151
19. Beiser M, Bean G, Erickson D, Zhang J, Iacono WG, Rector NA (1994) Biological and psychosocial predictors of job performance following a first episode of psychosis. Am J Psychiatry 151: 857–863
20. Shrivastava A, Shah N, Johnston M, Stitt L, Thakar M (2010) Predictors of long-term outcome of first-episode schizophrenia: a ten-year follow-up study. Ind J Psychiatry 52:320–326

21. Mausbach BT, Moore R, Bowie C, Cardenas V, Patterson TL (2009) A review of instruments for measuring functional recovery in those diagnosed with psychosis. Schizophr Bull 35:307–318
22. Tsang HW, Leung AY, Chung RC, Bell M, Cheung WM (2010) Review on vocational predictors: a systematic review of predictors of vocational outcomes among individuals with schizophrenia: an update since 1998. Aust NZ J Psychiat 44:495–504
23. Ramsay CE, Stewart T, Compton MT (2012) Unemployment among patients with newly diagnosed first-episode psychosis: prevalence and clinical correlates in a US sample. Soc Psychiatry Psychiatr Epidemiol 47:797–803
24. Lehman AF (1995) Vocational rehabilitation in schizophrenia. Schizophr Bull 21:645–656
25. Bond GR (1998) Principles of the individual placement and support model: empirical support. Psychiatr Rehabil J 22:11–23
26. Wexler BE, Bell MD (2005) Cognitive remediation and vocational rehabilitation for schizophrenia. Schizophr Bull 31:931–941
27. Jarbin H, Hansson L (2004) Adult quality of life and associated factors in adolescent onset schizophrenia and affective psychotic disorders. Soc Psychiatry Psychiatr Epidemiol 39:725–729
28. Gittelman-Klein R, Klein DF (1969) Premorbid asocial adjustment and prognosis in schizophrenia. J Psychiatr Res 7:35–53
29. Alanen YO, Räkköläinen V, Laakso J, Rasimus R, Kaljonen A (1986) Towards need-specific treatment of schizophrenic psychoses. Springer, Heidelberg
30. Seeman MV (1986) Current outcome in schizophrenia: women vs. men. Acta Psychiatr Scand 73:609–617
31. Salokangas RKR, Stengård E (1990) Gender and short-term outcome in schizophrenia. Schizophr Res 3:333–345
32. Tamminga CA (1997) Gender and schizophrenia. J Clin Psychiatry 58(Suppl 15):33–37
33. Riecher-Rössler A, Häfner H (2000) Gender aspects in schizophrenia: bridging the border between social and biological psychiatry. Acta Psychiatr Scand Suppl 407:58–62
34. Morgan VA, Castle DJ, Jablensky AV (2008) Do women express and experience psychosis differently from men? Epidemiological evidence from the Australian National Study of Low Prevalence (Psychotic) Disorders. Aust NZ J Psychiatry 42:74–82
35. Cotton SM, Wright A, Harris MG, Jorm AF, McGorry PD (2006) Influence of gender on mental health literacy in young Australians. Aust NZ J Psychiat 40:790–796
36. Salokangas RKR, Honkonen T, Stengård E, Koivisto A-M (2001) To be or not to be married: that is the question of quality of life in men with schizophrenia. Soc Psychiatry Psychiatr Epidemiol 36:381–390
37. Thorup A, Petersen L, Jeppesen P, Øhlenschlaeger J, Christensen T, Krarup G, Jørgensen P, Nordentoft M (2006) Social network among young adults with first-episode schizophrenia spectrum disorders: results from the Danish OPUS trial. Soc Psychiatry Psychiatr Epidemiol 41:761–770
38. Cooper B (2005) Schizophrenia, social class and immigrant status: the epidemiological evidence. Epidemiol Psichiatr Soc 14:137–144
39. Brugha T, Jenkins R, Bebbington P, Meltzer H, Lewis G, Farrell M (2004) Risk factors and the prevalence of neurosis and psychosis in ethnic groups in Great Britain. Soc Psychiatry Psychiatr Epidemiol 39:939–946
40. McGovern D, Hemmings P, Cope R, Lowerson A (1994) Long-term follow-up of young Afro-Caribbean Britons and white Britons with a first admission diagnosis of schizophrenia. Soc Psychiatry Psychiatr Epidemiol 29:8–19
41. Bae SW, Brekke JS, Bola JR (2004) Ethnicity and treatment outcome variation in schizophrenia: a longitudinal study of community-based psychosocial rehabilitation interventions. J Nerv Ment Dis 192:623–628
42. Salokangas RKR, Räkköläinen V, Alanen Y (1989) Maintenance of grip on life and goals of life: a valuable criterion for evaluating outcome in schizophrenia. Acta Psychiatr Scand 80:187–193
43. Schlosser DA, Jacobson S, Chen Q, Sugar CA, Niendam TA, Li G, Bearden CE, Cannon TD (2011) Recovery from an at-risk state: clinical and functional outcomes of putatively prodromal youth who do not develop psychosis. Schizophr Bull Aug 8. [Epub ahead of print]
44. McGlashan TH (1998) Early detection and intervention of schizophrenia: rationale and research. Br J Psychiatry Suppl 172:3–6
45. Salokangas RKR, McGlashan TH (2008) Early detection and intervention of psychosis. A review. Nord J Psychiatry 62:92–105
46. Klosterkötter J, Schultze-Lutter F, Bechdolf A, Ruhrmann S (2011) Prediction and prevention of schizophrenia: what has been achieved and where to go next? World Psychiatry 10:165–174