ORIGINAL PAPER

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Social network among young adults with first-episode schizophrenia spectrum disorders

Results from the Danish OPUS trial

■ **Abstract** *Background* Social network has considerable impact on physical and mental health. Patients experiencing first-episode psychosis early in adult life may experience severe problems concerning development and maintenance of their social network. *Methods* A total of 547 first-episode psychotic patients (18–45) were randomised to standard or integrated treatment, (ACT, social skills training and family intervention), and followed up at 2 years. *Results* Service use or psychotic symptom score did not influence the social network size, measured after the first 2 years of treatment. Small network size was associated with long duration of untreated psychosis (DUP), poor premorbid adjustment, male gender and severe negative symptoms. The number of friends at 2-year follow-up was predicted by age, A-level status, negative symptoms and number of friends at entry, while the determinants for number of family contacts were age, gender, disorganised dimension and family contacts at entry. *Conclusions* Premorbid functioning, network size at entry and DUP is closely related to small social network size. The integrated psychosocial treatment programme was not sufficient to address this problem.

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Introduction

Social relations both qualitative and quantitative have been proven to be very important for a person's mental and physical health [9]. Mortality rates from almost of all kinds of diseases increase with decreasing number of social contacts, even when all other risk factors (like tobacco, income etc.) are taken into account. This also affects patients with mental diseases such as psychosis [17, 20].

Patients who have an early onset of psychosis (before the age of 35) are often at a stage of life when social relations are being established or stabilised, and with all its consequences, the psychosis may disrupt this process. Especially, negative symptoms like anhedonia, asociality and anergia may influence the patients' social skills, abilities to create and maintain social contacts and to communicate with their closest acquaintances.

It is well known that patients with schizophrenia have smaller social networks than the general population [24] and that these networks are more likely to comprise family members rather than friends. Since social network is so closely related to health status and quality of life [7], social and interpersonal aspects of life for patients with first-episode schizophrenia syndrome diagnosis are of great importance. Improving patients' social networks may be a supplement to traditional treatment, and may strengthen their available and perceived social support thereby enhancing their ability to cope with crises and practical issues, and improving their social integration [10]. The TAPS study was among the first studies to investigate this [22].

Aim and hypotheses

■ Aim

This study describes the social networks of a sample of young first-episode psychotic patients by measuring the number of their social contacts with family or friends during the previous month at baseline and after the first 2 years of treatment. Another aim was to define what predicts the number of family members and friends in the social network after 2 years of treatment, and especially to determine if an intensive psychosocial and integrated treatment (IT) model that included family treatment and social skills training would influence that. These aims were set a priori.

■ Hypotheses

The hypotheses of this paper are listed below and are based on the literature stated in the reference list.

1. The IT model results in a larger network size for the patients randomised to that kind of treatment compared to the patients randomised to standard treatment (ST).
2. There are associations between male gender, young age, long DUP, poor premorbid adjustment, high levels of negative symptoms, long duration of admission and unemployment and a poor social network.

Methods

■ Design

This study is part of the Danish OPUS trial, a randomised controlled trial (RCT) comparing 'treatment as usual' (standard treatment, ST) with 'integrated treatment' (intensive psychosocial assertive community treatment, IT). This paper is based on data collected at initiation of treatment (at entry into the RCT) and at the 2-year follow-up. The OPUS study is described in detail elsewhere [31, 32].

■ Inclusion criteria

The inclusion period was from 1 January 1998 until 31 December 2000 in a defined catchment area. Patients aged between 18 and 45 were included if they met the criteria for the ICD-10 diagnoses of schizophrenia, acute psychoses, schizotypal disorder, schizoaffective disorder or other delusional disorders in the F20-spectrum. All patients had to be able to speak and understand Danish, none of the patients had been treated with antipsychotic medication for more than 12 weeks, and the psychiatric symptoms were not due to any organic condition. All patients signed informed consent forms.

■ Subjects

A total of 547 first-episode patients were included, 224 women and 323 men.

The patients were referred to the project from general practitioners, psychiatric wards (both in- and outpatients) or from social service centres and were interviewed and assessed by independent, trained professionals.

■ Instruments

Several interview-instruments were used to collect the data:

1. The diagnosis and any second diagnosis were based on SCAN-interview, version 2.0 and since 1999 version 2.1 [33].
2. IRAOS (Interview for the Retrospective Assessment of the Onset of Schizophrenia), developed by Häfner and colleagues, was used as an instrument to date when the first psychotic symptom occurred and thus to estimate DUP. This was only done with patients with psychotic symptoms [18].
3. All patients were asked about their socio-economic status.
4. Global functioning was measured by the Global Assessment of Functioning Scale, the function scores for the previous month and best month in the previous year (GAF-symptoms, GAF-function) [2]. The higher the scores, the better the functioning.
5. Psychopathologic symptoms were assessed using global scores of SAPS (positive symptoms) [4] and global scores of SANS (negative symptoms) [3], and divided into three dimensions: psychotic, negative and disorganised [5, 6]. The lower the scores, the lower the symptom severity.
6. Premorbid functioning was assessed with PAS (Premorbid Adjustment Scale) [11]. PAS consists of 36 items and four periods of life: childhood (age 8–11), early adolescence (age 12–15), late adolescence (age 16–18) and adulthood (age 19 and beyond). For each age period the data were divided into two dimensions: school functioning and social adaptation. Only early and late adolescence is reported here, since childhood data were too sporadic, and the adulthood period overlaps too much with the prodromal phase. The lower the scores, the better the functioning.
7. SNS (Social Network Schedule) was used to quantify and qualify the social networks at baseline and after 2 years of treatment. This was done by asking the patients to systematically name all their contacts (i.e. any person that the patients have had some kind of contact with, e.g. conversation, letter, telephone, practical matters, etc.) during the previous month (up to 25) and categorise them as family/acquaintances/professionals etc. and by asking questions about strains, friendship ('Do you see this person as a friend?') and confidence ('Do you feel you can confide in him/her?') in the relations [15]. The patients should use their own definitions of 'friendship' and 'confidence' when answering the questions.

■ Outcome measures

Social network size (i.e. number of contacts with family members and friends) was chosen as a proxy for the available and perceived social support, although this is a simplification of the effects of social network, since social relations may also have a negative influence on the patients' lives.

■ Predictors of social network size

In order to investigate the influence of the different variables on the social network size, the following categories for the dependent variable were constructed:

0 = 0 contacts with family members (or friends, respectively) during previous month
1 = 1 contact with family members (or friends, respectively) during previous month
2 = 2 contacts with family members (or friends, respectively) during previous month
3 = 3 or more contacts with family members (or friends, respectively) during previous month

The cut-off point between 2 and 3 contacts was set arbitrarily, based on the assumption that the change from 2 to 3 contacts represents an 'existential' difference between the group with the absolute poorest network (typically those who have had contact only with their mother and another family member) and those who had a few more contacts. This allowed us to analyse the predictors of the poorest network status. Also, we considered the number of contacts to be a 'non-linear' variable, meaning that an increase from e.g. 10 to 11 contacts is not as important and crucial as an increase at the lower end of the scale, e.g. from 1 to 2 contacts. While the first two contacts very often were family members, it was more likely that the social network would also comprise friends or others when the number of contacts exceeded three.

■ Ethics

Approval by the Danish Ethics Committee and by the Danish regulatory authorities was obtained before the study was initiated.

■ The intervention

The treatment period was 2 years. Patients in both treatment groups were offered antipsychotic medication according to guidelines from the Danish Psychiatric Society (Dansk Psykiatrisk Selskab DPS 1998) recommending a low-dose strategy for first-episode psychotic patients and use of SGA (second generation antipsychotics) drugs of first choice.

■ Integrated treatment (IT)

A multidisciplinary team with a 1:10 caseload (i.e. one team member per ten patients) provided the IT elements consisting of assertive community treatment, social skills training and multi-family groups. Included in the team were a psychiatrist, a psychologist, a psychiatric nurse, an occupational therapist and a social worker. With the 'integrated' approach one primary staff member was responsible for coordinating all the treatment elements and social arrangements and maintained the primary contact with the patient. An individual and flexible treatment plan was made in cooperation with each patient in order to meet his or her needs and expectations and to ensure treatment adherence. Patients saw their primary staff member weekly, often in the patients' homes, and the primary staff member kept in contact if patients were admitted and coordinated the treatment plan at discharge.

A social skills training programme focusing on psycho-education, e.g. basic social skills, was provided for patients either individually or in groups, after evaluation of their abilities and needs. It was based on problem-solving strategies learned from role-plays and principles from cognitive therapy. It took place biweekly in the first 2 months and then once a week in the following 10 months. Depending on the patients' and the relatives' needs and willingness to cooperate, there were offers to join psycho-educational multifamily groups a.m. McFarlane, focusing on problem-solving procedures. Starting with individual family meetings without the patient and a workshop with formal education for 4–6 families, the multifamily groups met 1½ h bimonthly for 18 months.

■ The standard treatment (ST)

The ST consisted of the standard mental health service routines in Copenhagen and Aarhus. Participation in the trial had no influence on the treatment offered to these patients. The average caseload was 1:25 (i.e. one case manager per 25 patients). Contacts usually took place at the community mental health centre. Patients receiving ST and patients receiving IT were admitted to the same psychiatric departments, but unlike the IT patients, the ST patients did not have the special weekly support meetings with the primary staff

member from the IT-team. The primary staff members in ST were case managers who had limited time and resources for arranging home visits or groups. Psychosocial treatment elements like counselling, psycho-education, and contact with family were provided infrequently and in a less intensive, non-systematic way and only for a minority of cases.

■ Statistical methods

Comparisons were made with one-sample t-tests for continuous measures and Pearson's chi-square and Fisher's exact tests for categorical measures. Kruskal–Wallis's test was used to analyse the DUP data.

An ordinal logistic regression model was used to determine the predictors of the size of the social network at 2-year follow-up. Two dependent variables, friends network and family network, were chosen, and the independent variables were analysed separately in the univariate analyses. In the multivariate analyses, all independent variables were entered, and a backwards-stepwise regression analysis was used. The parameter estimates in Table 2 indicate how one numeric change in the independent variable will be reflected in change of the dependent variable (the categories of network size (categories 0–3)). For example, the parameter estimate for age is −0.07 indicating that when age goes up with 1 year, category of network size will decrease −0.07. Type of treatment (ST versus IT) and site (Copenhagen versus Aarhus) were obligate covariates in all analyses. SPSS 11.0 software was used.

Results

■ Representativeness

All patients included were first-episode patients (i.e. were diagnosed for the first time). Analyses of representativeness revealed that the number of first-episode patients included in the project corresponded to 90% in Aarhus and 63% in Copenhagen of the patients registered in the psychiatric case register as having had their first contact with psychiatric services in the same period and diagnosed within the same diagnostic spectrum. Comparison between the patients included in the project and the official statistics revealed no differences in sex distribution, but at both centres the patients included in the trial were significantly younger, and significantly more were diagnosed with schizophrenia (66% in the project versus 42% in the register). The representativeness of the patients with schizophrenia is thus better than for the whole sample.

■ Dropout

The Consort diagram (Fig. 1) shows the flow of patients in the study.

A total of 369 patients (67%) completed the entire 2-year follow-up interview. Of them 347 had completed the SNS and 332 of those had also completed SNS at baseline. Of the 347 patients 153 patients received ST and 194 were randomised to IT ($P = 0.001$). There were no significant differences between the patients who completed SNS and those who did not complete SNS at 2-year follow-up regarding sex, age,
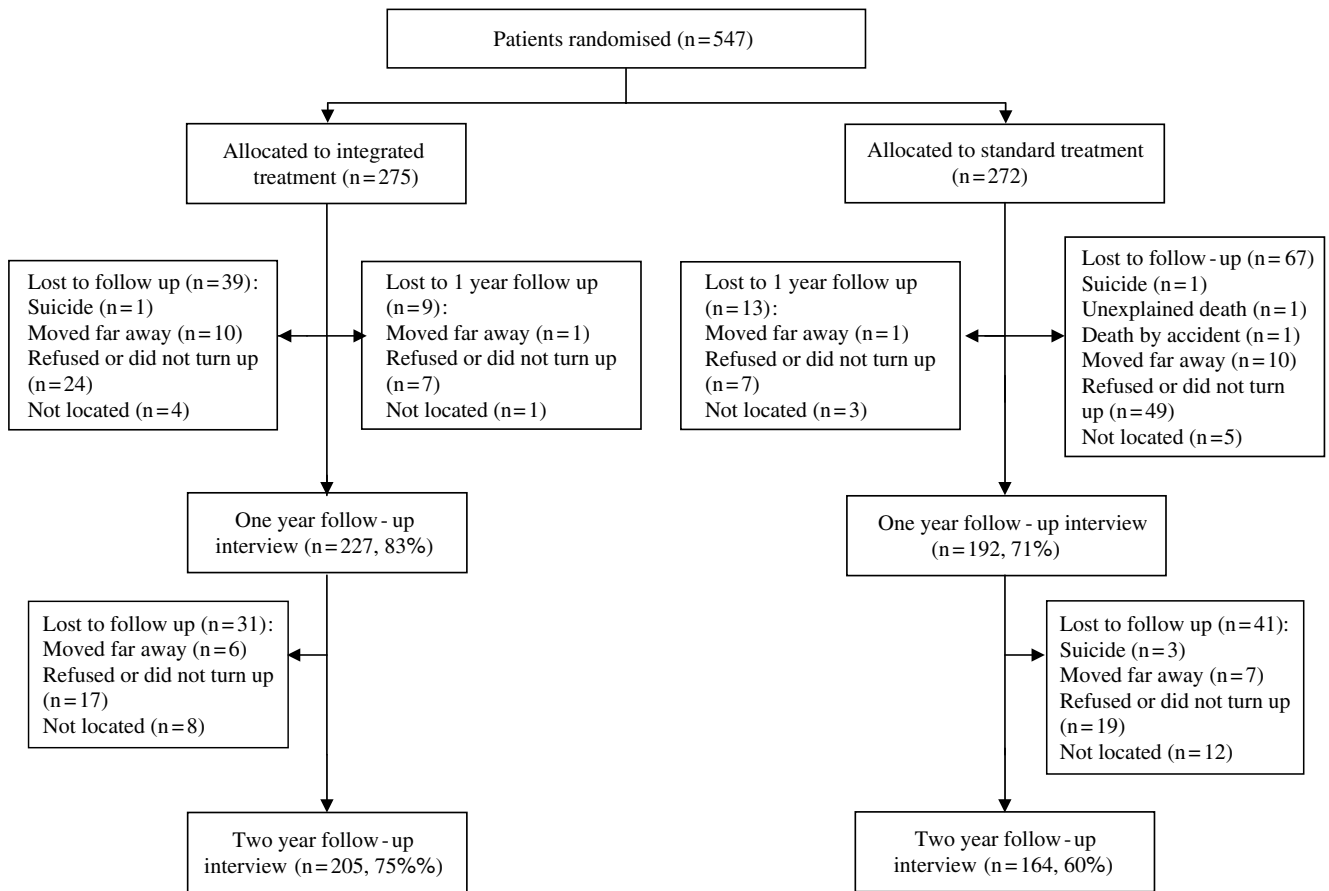
Fig. 1 Consort diagram of the flow of the 547 patients included and randomised

psychopathology and 'number of contacts with family or friends at baseline', but the dropout rate was significantly higher for patients from ST, from Copenhagen and for patients with a second diagnosis of abuse. These were also the characteristics of the dropouts of the overall project, where more patients from ST dropped out than from IT (40% vs. 25%).

■ Characteristics at entry and after 2 years of treatment

We found that with falling number of contacts (both family and friends) during the previous month, the mean age is increasing. At 2-year follow-up, the difference in age between the patients with the smallest networks and the patients in the other two categories is even more marked, indicating that the older the age, the smaller the network. Figure 2 gives a graphical impression of the comparison of the mean social network size at entry and after 2 years for six age groups. The average family-network size exceeds the friends network size. Mean number of contacts with family and friends was 7.6 at entry and 8.2 at follow-up (all patients, data not shown).

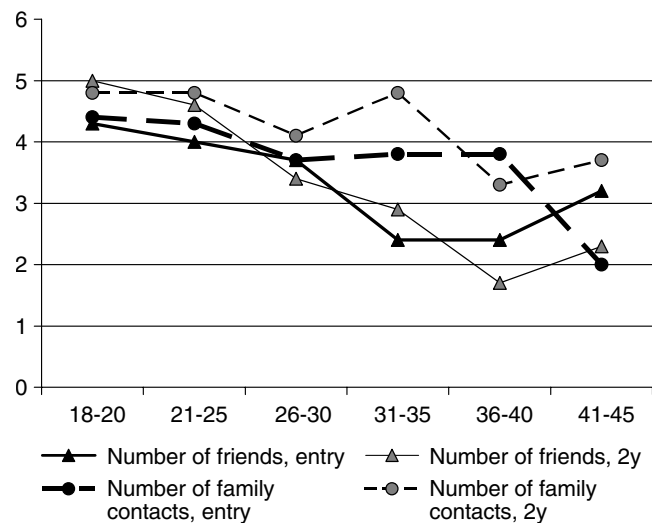There were no significant gender differences in size of social network at entry, but at 2-year follow-up, the

Fig. 2 Mean number of contacts with family (broken lines)/friends (continuous lines) at entry and at 2-year follow-up divided by age groups

males dominate the category of small network (Table 1). The combination of the diagnosis of schizophrenia and no completed A-levels is significantly associated with a small network at both times, too. A strong association is found with DUP, where

Table 1 Characteristics of the OPUS sample, divided by primary network size at entry and at 2-year follow-up

	Entry, total N = 505[a]				Two-year follow-up, total N = 347			
	0–2 fam/friends N = 71(14%)	3–6 fam/friends N = 191 (38%)	7+ fam/friends N = 243 (48%)	Significance of distribution/diff. of means	0–2 fam/friends N = 32 (9%)	3–6 fam/friends N = 124 (36%)	7+ fam/friends N = 191 (55%)	Significance of distribution/diff. of means
Males, % of all males	41 (14%)	121 (41%)	133 (45%)	ns*	25 (12%)	82 (41%)	94 (47%)	P < 0.05*
Females, % of all females	30 (14%)	70 (33%)	110 (52%)		7 (5%)	42 (29%)	97 (66%)	
Schizophrenia, % of all sch.	48 (15%)	139 (42%)	145 (44%)	P < 0.05*	30 (13%)	86 (37%)	114 (50%)	P < 0.01*
All other diagnosis, % of all other diagnoses	23 (13%)	52 (30%)	98 (57%)		2 (2%)	38 (33%)	77 (66%)	
Depend. syndrome at entry, % of all with dep.	10 (8%)	53 (41%)	65 (51%)	ns*	10 (12%)	29 (35%)	43 (52%)	ns*
No depend. syndrome at entry, % of all with no dep.	61 (16%)	138 (37%)	178 (47%)		22 (8%)	95 (36%)	148 (56%)	
A-levels completed, % of all with A-levels	25 (15%)	53 (31%)	95 (55%)	P < 0.05*	12 (9%)	36 (27%)	88 (65%)	P < 0.01*
No A-levels completed, % of all without A-levels.	46 (14%)	138 (42%)	147 (44%)		20 (10%)	88 (42%)	102 (49%)	
No work at time for assessment, % of all without work	49 (16%)	127 (42%)	129 (42%)	P < 0.01*	27 (13%)	87 (42%)	44 (49%)	P < 0.05*
Work at time for assessment, % of all with work	22 (11%)	63 (32%)	112 (57%)		5 (4%)	36 (26%)	95 (70%)	
Standard treatment, % of all in ST	41 (17%)	93 (37%)	115 (46%)	ns*	17 (11%)	48 (31%)	88 (58%)	ns*
Integrated treatment, % of all in IT	30 (12%)	98 (38%)	128 (50%)		15 (8%)	76 (39%)	103 (53%)	
Age, mean years	29.1	27.3	25.0	P < 0.01**	33.5	29.7	27.5	P < 0.01**
DUP, median in weeks[b]	113	57	34	P > 0.01***	89	74	34	P < 0.01***
Days of admission, 0–2 years	–	–	–	–	41	23	36	ns**
Premorbid social functioning index (0–1)	0.42	0.32	0.24	P < 0.01**	0.37	0.36	0.26	P < 0.01**
Premorbid academic functioning index (0–1)	0.45	0.44	0.38	P < 0.01**	0.42	0.44	0.37	P < 0.01**
Psychotic dimension at time of assessment	2.4	2.7	2.7	ns**	1.40	1.29	1.04	ns**
Negative dimension at time of assessment	2.3	2.3	1.9	P < 0.01**	2.44	1.92	1.21	P < 0.01**
Disorganised dimension at time of assessment	1.0	1.0	1.0	ns**	0.81	0.44	0.31	P < 0.01**
GAF-symptoms, at time of assessment	31.4	33.1	34.9	P < 0.05**	40.9	48.1	54.2	P < 0.01**
GAF-function at time of assessment	35.7	39.6	45.3	P < 0.01**	43.7	50.3	58.6	P < 0.01**
Mean (median) number of confidents	1.16 (0)	2.63 (2)	6.86 (7)	P < 0.01**	1.28 (1)	3.06 (3)	6.42 (6)	P < 0.01**

** Pearson's chi-square test; *** ANOVA; *** Kruskal–Wallis

[a] 547 patients were included, but due to missing data only 505 who completed SNS are included here

[b] All patients without DUP (schizotypal disorder, schizophrenia simplex) were excluded from analyses, N = 408 at entry, N = 274 at 2 years follow-up

the median is 113 weeks for patients with small networks at entry and 57 weeks/34 weeks, respectively for the other categories. Among the patients with small networks, we also saw poorer premorbid adjustment in both dimensions (social and academic) at both time points.

While the psychotic scores were not significantly correlated with the different social network categories, the negative symptom scores were significantly better with increasing network size, at both times.

■ The RCT

Figure 3 shows the distribution of the different treatment elements in IT and ST, respectively [32]. Table 1 shows that the type of treatment did not affect the social network size after 2 years of intervention, since the distribution was not significantly different for ST and IT. At 2-year follow-up, IT patients had on average 4.3 contacts with family members in the previous month, while ST patients had on average 4.7 contacts ($P = 0.28$). The average number of contacts with friends during previous month was 3.8 for both IT and ST patients.

■ Predictors

In Table 2, predictors of family network size and friends network size at 2-year follow-up are studied separately. The final models included both age and network size at entry, but while the final model for family-network size included male gender and disorganised dimension, the friends-network size model included negative symptoms and A-level status as the significant variables. The univariate models show that dependence syndrome leads to less family contact, while not having completed high school and poor academic premorbid functioning do not. The geographical variable 'site' only has significant impact on number of friends.

Discussion

This study confirmed most of our hypotheses, but rejected some. First of all, the IT did not affect the size of the social network after 2 years. Small network size at entry and at follow-up was associated with long DUP, poor premorbid adjustment, male gender, and high negative symptom scores, but contrary to our expectations, not with young age or number of days of admission. The number of friends in the network after 2 years was predicted by age, high school status, negative symptoms and number of friends at entry, while the determinants for number of family contacts at 2 years were age, gender, disorganised dimension and family contacts at entry.

Below, some critical methodological issues will be considered, and the results will be discussed.
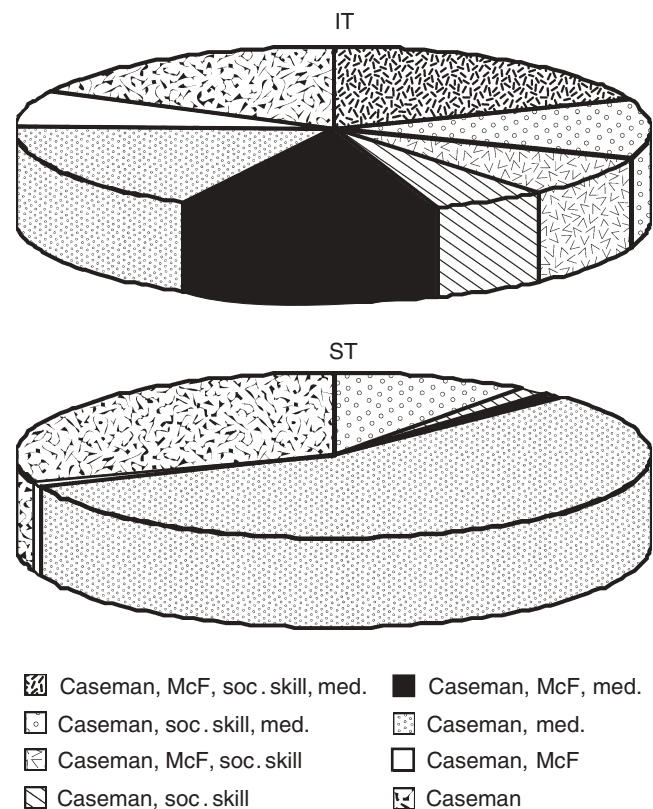

Fig. 3 Distribution of treatment elements provided in IT and ST (0.8% insufficient registration in IT and 5.6% in ST) (first published in [32])

■ Attrition and representativeness

Attrition was considerable, but not different from other studies of this kind [28]. As mentioned, attrition was skewed, with more patients from IT participating in the follow-up. This was not unexpected since part of the IT approach was to be assertive and persistent, also when patients were reluctant or withdrew. Most likely, we can assume that the dropouts are the patients with the greatest difficulties. Thus, the IT group comprised more patients with severe illness than ST, and treatment effects may be underestimated.

We consider the external validity to be quite good, as the sample was drawn from the core group of this patient category. Since the patients who dropped out had the same size of network at entry, we believe that we can generalise to the whole sample, although the dropout rate was considerable. The dropouts could of course be the group of patients with the highest risk of a network contracting or vice versa, but since the social network size is a relatively stable factor and the follow-up period was only 2 years, this seems unlikely.

An unknown number of patients who had received antipsychotic medication for more than 12 weeks may have been included in the official register but not in the study, due to our exclusion criteria.

Table 2 Ordinal logistic regression predicting friends-network size and family-network size at 2-year follow-up

	Number of friends 2 years, categorised, N = 332: 0 = 0 friends; 1 = 1 friend; 2 = 2 friends; 3 = 3+ friends						Number of family contacts 2 years, categorised, N = 332: 0 = 0 family contacts; 1 = 1 family contacts; 2 = 2 family contacts; 3 = 3+ family contacts					
	Univariate			Multivariate			Univariate			Multivariate		
	Parameter-estimate	CI	p-value	Parameter-estimate	CI	p-value	Parameter-estimate	CI	P-value	Parameter-estimate	CI	p-value
Age (years)	−0.07	−0.11−−0.04	<0.001	−0.07	−0.10−−0.03	<0.001	−0.05	−0.09−−0.016	0.005	−0.04	−0.09−−0.02	0.04
Male gender	−0.47	−0.89−−0.05	0.03	−	−	−	−0.88	−1.39−−0.36	0.001	−0.86	−1.43−−0.28	0.004
Urban site (CPH)	1.07	0.65−1.49	<0.001	0.72	0.24−1.20	0.004	0.26	−0.21−0.74	0.29	0.27	−0.28−0.83	0.34
Standard treatment	−0.06	−0.47−0.35	0.78	−0.17	−0.62−0.27	0.45	0.07	0.40−0.55	0.762	0.29	−0.25−0.84	0.29
Dependence syndrome present	−0.08	−0.57−0.41	0.75	−	−	−	−0.61	−1.14−−0.08	0.03	−	−	−
No work at entry	−0.41	−0.83−−0.02	0.06	−	−	−	−0.82	−1.34−−0.30	0.002	−	−	−
A-level completed	0.76	0.33−1.20	0.001	0.74	0.27−1.22	0.002	0.34	−0.16−0.84	0.182	−	−	−
Schizophrenia	−0.43	−0.02−0.87	0.06	−	−	−	−1.06	−1.65−−0.48	<0.001	−	−	−
LnDUP (weeks)	−0.13	−0.23−−0.03	0.02	−	−	−	−0.22	−0.35−−0.10	<0.001	−	−	−
Psychotic dimension	0.03	−0.11−0.18	0.65	−	−	−	−0.02	−0.19−0.14	0.76	−	−	−
Negative dimension	−0.36	−0.55−−0.18	<0.001	−0.26	−0.46−−0.06	0.012	−0.2	−0.42−−0.01	0.07	−	−	−
Disorganised dimension	−0.14	−0.37−0.08	0.22	−	−	−	−0.33	−0.58−−0.08	0.009	−0.29	−0.58−−0.03	0.048
PAS social index	−1.33	−2.35−−0.31	0.01	−	−	−	−1.18	−2.35−−0.01	0.048	−	−	−
PAS academic index	−1.66	−2.79−−0.54	0.004	−	−	−	−0.96	−2.24−0.313	0.14	−	−	−
Number of contacts at entry, categorised	0.54	0.36−0.72	<0.001	0.47	0.29−0.65	<0.001	0.80	0.56−1.04	<0.001	0.74	0.49−0.98	<0.001

■ Geographical differences

When we analysed the data for the two geographical sites separately we found some differences. On average, patients living in rural areas (Aarhus) reported fewer friends and family contacts than those from urban areas (Copenhagen). We believe that this could at least partly be due to cultural norms and traditions involving more limited or less close contact with others in less urbanised areas, and less inclination to report contacts as friends. Also, practical aspects in terms of geographical long distances and poorer infrastructure may explain these differences. To take account of this 'site' was entered as an obligate covariate in the model.

■ Statistics

With respect to significance level, one alternative would have been to apply a Bonferroni correction to control for multiple testing. But, since the comparison of treatment types is not at all significant, and since many of the P-values are below 0.01 this would not change the overall results.

■ Instruments

SNS

SNS is an instrument with good validity and interrater reliability [8, 15]. Unfortunately, we did not test the interrater reliability. However, we considered the manual to be very exact, and most patients found it easy to answer the questions, although it can be quite time consuming. This last aspect might have affected the number of contacts registered since SNS counts up to 25 contacts. However, as our maximum cut-off is 7+, we believe that our data on number of contacts up to 7 are very reliable. SNS was created in the early nineties and does not mention electronic communication like SMS text messages and e-mail so this may be underreported, with the result that important and frequent contacts with, for instance, family members who live far away may not be counted.

Having a large social network does not necessarily lead to better social and emotional support. Some relationships may be fraught or demanding for the patients and cause extra distress. One question in SNS investigates this, but is not reported here. SNS does not distinguish between practical and emotional support, or between perceived available support and actually provided support. More qualitative methods are required to analyse these aspects. The mental state of the patients may also have influenced their perception of the questions and of their social network. A patient with paranoid delusions may experience that it is hard to trust or confide in anybody or that former friends are now 'enemies'. Another bias is that

the month prior to seeking treatment may not be considered as a 'typical' month concerning social contacts for all patients.

The intervention

Half of the patients in the study received the IT, although not all patients received all elements (for details see [32] and Fig. 3). The main elements were: assertive community treatment in terms of continuous and frequent contact with a primary staff member, family intervention, and social skills training. Especially the two latter elements include a direct focus on social network, and the hypothesis therefore was that IT would sustain or even improve the social networks. In accordance with the family intervention manual, family members or friends were strongly encouraged to be involved in the treatment plan and to join workshops on psycho-education as well as the multifamily groups. Psycho-education focusing on aetiology, course and pharmacological treatment of the illness was provided to improve the future contact and support. The multifamily groups aimed among other things at bringing families together who were in the same situation in order to reduce feelings of stigma and isolation, and generate new relationships. We know that some of the multifamily groups kept on meeting on a regular basis even after treatment had ended. Also, communication patterns and emotional climate in the families were discussed. But these efforts did not result in a significantly higher number of familial contacts after 2 years in the IT group. A possible explanation is that family members are the last persons to break off contact, irrespective of both type of treatment and severity of illness.

Social skills training focusing on communication and relationship maintenance was regarded by the OPUS treatment teams as very important in helping these patients overcome the obstacles of psychosis. Groups of 5–8 patients met with two therapists on a weekly basis, and training consisted in role-plays, teaching and group discussions.

But, in spite of these efforts, there were no differences in the social network size between the two treatment groups. The IT has been shown to ameliorate negative symptoms [32], but the expectation that the IT patients would 'gain a friend' during the 2 years of treatment may have been too optimistic. There is lack of consensus on the extent to which the effects of social skill training are limited by the difficulty that patients with schizophrenia have in generalising from the training situation to real life encounters [21]. In the NICE guidelines [29], it is concluded that there is only limited evidence that social skills training improved social functioning. It has been mentioned that follow-up support and booster sessions may be necessary to maintain the effects [16]. Also, stigma can prevent patients from making new contacts. On this basis, the conclusion is that, although highly relevant treatment elements were provided, the biological factors of this disease are so powerful that an even more intensive psycho-social effort is required to effect major changes in the relational aspects of life, such as an increase of the social network size. For some patients, the primary goal was not to enlarge the social network, but rather to identify the most resourceful and 'equal' friends in their social network and to protect themselves from stressful or even harmful relationships. The patients would discuss these aspects with their primary staff member or in the social skills training groups.

DUP

Evidence of association between DUP and outcome is somewhat contradictory [30], although there are several indications of correlation between DUP and poor outcome [13, 26, 27]. Therefore, it is not surprising that long DUP is associated with small size of social network. A long-lasting untreated psychotic episode may cause isolation, introvert behaviour, social anxiety and thus decreased contact with friends and family. For young patients who are in the life phase of establishing social relations, this may have great impact on the size of the network and the available support. But this pattern is even recognised earlier, namely in the prepsychotic/prodromal phase, as this study found that the premorbid adjustment scores were poorer for patients with small social networks. This indicates that the pathological process is initiated long before the psychotic symptoms emerge and long before full-blown psychosis, but a causal direction cannot be defined on the basis of the data presented here. This has recently been demonstrated by Agerbo et al. [1], who found a strong, long-term association between schizophrenia and singleness, disadvantaged socio-economic position, and labour market marginalisation seen up to 25 years before first admission.

DUP and PAS became insignificant during the regression analyses because of colinearity with other variables of which age and negative dimension, respectively, were the most important and were therefore not included in the final model. Most studies have found DUP unrelated to age of onset of psychosis [30].

We found an association between poor social network and older age (Fig. 2, Table 2), a possible explanation being that younger patients are better supported by their families, while a deterioration of social competences can be found over time for the older patients. This tendency is also found in the background population [14].

Psychopathology

Hamilton et al. [19] found, like this study, an association between social network and negative symp-

toms but not psychotic symptoms. Negative symptoms like anergy, apathy and asociality influence the patients' social skills [25], and symptoms like anhedonia may contribute to this by diminishing the patients' initiative and feelings of meaningfulness. Hamilton concludes that, "once the course of illness is chronic, the negative symptoms of schizophrenia, not the positive symptoms, are associated with network disruption".

We saw that this especially influences the friends-network, while family members are more assertive in terms of staying in touch with the patients.

■ Admission

Number of days of admission did not have significant impact on the social network size or development, maybe because most admissions are of short duration and many health services are now provided in out-clinics and by home visits etc. These patients are all first-episode patients, but for those who develop a chronic course long admission may over time decrease their contact with their social networks, as previous studies [12, 23] have found.

Conclusion

In this sample of young first-episode patients with schizophrenia spectrum disorders, we found strong correlations between poor social network size and development and long DUP, poor premorbid adjustment and high levels of negative symptoms. IT was provided for half of the patients, but did not result in network improvement. Further investigation is required to address the problems concerning which treatment elements will help these patients maintaining and enhancing their social network.

Declaration of interests

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770

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