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**Correlation between some features of social networks
and treatment outcomes of schizophrenic patients
three years after the first admission. A follow-up study**

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Significant correlation was found between certain features of social networks of schizophrenic patients three years after the first admission (size, age, number of persons involved, duration of relationships in the network, type of support system, amount and localisation of support), 'specific aims of treatment' (insight, satisfaction with treatment, compliance, motivation for treatment), and outcome of treatment at the psychopathological and social level.

Key words: social network, schizophrenia, treatment outcome.

Introduction

The first observations testifying to the correlation between the condition of schizophrenic patients and the changes in their social network are almost as old as the diagnosis of schizophrenia. Even Bleuler wrote about the sudden improvement observed in chronic schizophrenic patients after the death of their close relatives [1]. In the sixties and seventies, in a variety of social and medical studies, a correlation was found between the size of the social network and the type of relationships in it with coronary heart disease, depression, satisfaction with life and the quality of life – to list just the most convincingly documented issues [1, 2, 3].

Zubin [4] formulated an opinion that the patient's social network may have either a positive or negative impact on the course of schizophrenia, which pointed out to the possibility that social network, may be a leading factor.

Since the end of the sixties, researchers have been interested in social networks of schizophrenic patients. According to them, two approaches are possible. In the first approach, the social network is perceived as an expression of the needs of the patient. What is studied then is how and to what extent these needs are satisfied. In the second approach, the social network is described as a social structure [5] that reflects rela-

tionships between an individual and the environment. This structure usually consists of smaller substructures. Silberfeld [2] observed that schizophrenics have smaller networks and they spend less time with those who are important for them. Social networks of schizophrenic patients become impoverished because of the asymmetry of relationships [6], while the risk of relapse and readmission is the highest in those patients who have low-density networks [7]. Networks of schizophrenic patients are relatively the smallest ones (8-12 persons) and they tend to form just one subgroup. If there are more subgroups in the network, usually only single connections appear between them. Schizophrenics often exclude from their network long-term relationships, for instance old friends or siblings, while they include in it short-term relationships, for instance with a nurse or fellow patients whom they have just met in the ward. The relationships in the network are characterised by dependence, ambivalence and lack of reciprocity, e.g. by no mutual assistance. For a schizophrenic patient the network may be an important source of support, whereas the patient provides no support to other members of the network [6, 8].

The studies on social networks of schizophrenic patients are based on the assumption that psychotic decompensation is a crisis of the social network and that the characteristics of the schizophrenic patient's relationships with his/her social environment are connected with the course of the illness and treatment.

In our previous article [9] we compared social networks of those schizophrenic patients who were embraced by the community treatment programme and those who participated in the individual treatment programme. Three years after their first admission, the patients in the community treatment programme received more support from and had more new relationships in their social networks than those patients who were treated individually. This study analyses the correlation between social network and treatment outcome.

Aims of the study

Three research goals were identified:

1. to study the correlation between the features of social networks and the specific aims of treatment: insight, satisfaction with treatment, compliance and motivation for treatment in the group of schizophrenic patients, three years after their first admission;
2. to study the correlation between the features of social networks and treatment outcome at the psychopathological level three years after the first admission;
3. to study the correlation between the features of social networks and treatment outcome at the social level three years after the first admission.

The study group

The study was carried out on a group of 56 schizophrenic patients, diagnosed according to DSM-III, including 32 women and 24 men who received treatment in the outpatient ward of schizophrenia therapy and rehabilitation. The evaluation was made

three years after their first psychiatric hospital admissions, which had occurred in the Kraków Psychiatric Clinic between 1985 and 1988. The age of the patients oscillated between 21 and 42, the average age being 28. The patients had primary education (4 patients), vocational education (12), and secondary education (19); 9 patients did not complete their studies and 12 had higher education. The period between the onset of the illness and the first admission was up to 9 weeks with 21 patients, up to 99 weeks with 28 patients, and over 99 weeks with 7 patients.

Within three years after the first inpatient hospitalisation, 15 patients were admitted once to either inpatient or outpatient wards, 23 patients were admitted twice, 8 patients – three times, 5 patients – four times, 4 patients – five times, 1 patient – eight times.

The tools and the method

The social network was examined with Bizoń's questionnaire, and treatment outcome at the psychopathological and social levels was evaluated with the help of a semi-structured interview in the K-3 follow-up chart, and the BPRS-LA and SAS scales. The aims of the treatment, such as compliance, motivation for treatment, insight into the illness, were evaluated with Likert's scale in the follow-up chart in co-operation with the guardians, while the patient subjectively evaluated satisfaction attained from the treatment.

To evaluate psychopathology, the BPRS scale was used. This scale consists of 25 items, and in each of them 1 to 7 points can be scored. Items 13, 14, 17, 18, 20 (motor retardation, blunted affect, non-compliance, emotional withdrawal and poor grooming) form the BPRS sub-scale of negative symptoms. The remaining items build up either the sub-scale of positive or non-specific symptoms.

The features of social networks were examined with the use of Bizoń's questionnaire, as described in the study by Axer [10] or in our previous article [9]. Because it is a rarely applied tool, let us recapitulate that it serves to gather data about those people who perform support functions in relation to the surveyed and to describe the typical features of the support system, such as:

1. the size of the network; that is the number of persons with whom an individual remains in contact. A small network includes up to 10 persons, an average one up to 20 persons, a large network up to 30 or more persons.
2. age of the network; namely the duration of the relationships maintained with the people in the network. Relationships are grouped as follows: those lasting up to one year, the ones lasting 1-10 years and those lasting over 10 years.
3. type of the support system, which characterises the system as to whether one person fulfils more than three support functions and satisfies all the needs of the patient (concentrated system), or many people perform various functions (dispersed system). Those who cannot be classified as having one of the two above-mentioned systems, have a so-called mixed system (consisting of a confidant and several persons who satisfy particular needs, e.g. only financial needs). The type of the support system was established on the basis of Likert's scale (concentrated

system: 1; dispersed system: 2; mixed system: 3, the last being the optimum system, typical of networks of the 'healthy' population).

4. the amount of support, which is measured with the number of functions of the social network. The distinction is between systems from which the patient receives little support, average support or much support. In Likert's scale, much support counts as 1 (over 51 points), average support as 2 (21-50 points) and little support as 3 (0-20 points).
5. localisation of support; that is whether the patient receives most of support from the family or from extra-familial relationships (criterion 75%).
6. the size of the network outside the family. A small network embraces up to 2 persons, a middle-sized network has up to 10 persons and a large network 11 or more persons.

The criteria adopted to establish treatment aims in outpatient treatment were as follows: insight, motivation for treatment, compliance in taking medication, subjective satisfaction with treatment.

The criteria adopted to evaluate treatment outcome were the intensity of psychopathological symptoms, the course of the illness according to the WHO standards, the number and duration of re-admissions, the number of relapses in three years, employment, social functioning according to DSM-III and SAS, social contacts evaluated according to the Likert's scale.

The correlation between the features of social network, treatment aims and treatment outcome were measured with Spearman's correlation coefficient.

Results

Social network vs. treatment aims

Table 1 shows the correlation between the features of the social network and treatment aims (compliance in taking medication, motivation for treatment, insight into the illness, subjective satisfaction with treatment) in the three-year follow-up. The following correlation was found:

1. There exists a statistically significant, strong positive correlation between the type of support system and treatment aims. Namely, when the support system in the patient's social network is more dispersed, he/she is more compliant, is better motivated towards treatment, and, subjectively, is more satisfied with treatment.
2. There exists a statistically significant correlation between the type of support system and the localisation of support and the patient's insight in the illness, that is more insight in the illness is dependent on a more mixed support system, localised mainly in the family.
3. A very strong, statistically significant correlation appears between the size of the network outside the family and the treatment aims. The larger the extra-familial network, the better the motivation for treatment, better insight into the illness and more satisfaction with treatment.

Table 1

**Correlation between features of social network and treatment aims,
three years after first admission**

Specific aims of treatment	Type of support system (concentrated, dispersed, mixed) ↑	Age of network ↓	Size of network ↓	Amount of support ↓	Localisation of support ↓	Size of network outside family ↑
Sum of achieved specific aims of treatment	0.40**	-0.10	-0.07	-0.14	-0.22	0.48**
1) compliance	0.38**	-0.11	-0.07	-0.16	-0.19	0.05
2) motivation for treatment	0.40**	-0.10	-0.06	-0.16	-0.20	0.46**
3) insight into the illness	0.38**	-0.11	-0.14	-0.21	-0.27*	0.43**
4) subjective satisfaction with treatment	0.40**	-0.10	-0.10	-0.17	-0.23	0.48**

*p < 0.05

** p < 0.01 measured with Spearmann's correlation coefficient

Social network vs. treatment outcome

The analyses of correlation between the features of social networks and treatment outcome were made separately for the psychopathological (Tables 2a and 2b) and social levels (Table 3).

Table 2a

**Correlation between features of social networks and psychopathology
measured with BPRS-LA three years after first admission**

Treatment outcome: psychopathology	Type of support system (concentrated, dispersed, mixed) ↑	Age of network ↓	Size of network ↓	Amount of support ↓	Localisation of support ↓	Size of network outside family ↑
BPRS: global evaluation	0.16	-0.21	-0.49**	-0.30*	-0.24	-0.42**
BPRS: negative sub-scale	0.28	-0.17	-0.48**	-0.34**	-0.31*	-0.25
BPRS: positive sub-scale	0.19	-0.29	-0.29**	-0.20	-0.16	-0.30*

* level of significance p < 0.05

** level of significance p < 0.01, measured with Spearmann's correlation coefficient

Psychopathology

The correlation between the features of the social networks and the intensity of psychopathological symptoms were analysed separately in the BPRS positive and negative sub-scales (Table 2a). There exists a statistically significant correlation between the intensity of psychopathology, as measured with the BPRS-LA, and the size of the network, amount and localisation of support. It can be described as follows:

1. The more intense positive symptoms (measured with BPRS-LA), the smaller is the patient's social network and extra-familial network.
2. Negative symptoms (measured with BPRS-LA) intensify as the network and the amount of support, localised mainly in the family, become smaller.

Presented below (Table 2b) is the correlation between the features of social networks and the remaining criteria of treatment outcome.

Table 2b

Correlation between features of social networks and treatment outcome at the psychopathological level three years after first admission

Treatment outcome: psychopathology	Type of support system (concentrated, dispersed, mixed) ↑	Age of network ↓	Size of network ↓	Amount of support ↓	Localisation of support ↓	Size of network outside family ↑
Duration of hospitalisation (weeks)	-0.07	0.06	0.01	0.02	0.14	0.07
Number of outpatient hospitalisations in 3 years	0.34*	-0.03	0.14	-0.24*	-0.19	0.55**
Duration of outpatient hospitalisation	-0.03	0.03	0.03	-0.01	0.01	0.42**
Relapses	0.10	0.16	0.17	-0.003	0.15	0.04
Course of illness acc. To WHO	-0.21	-0.12	-0.04	-0.12	0.09	-0.08

*p < 0.05

** p < 0.01 measured with Spearman's correlation coefficient

Based on the analysis of this correlation, the following conclusions were formulated:

1. The mixed system of social support and the fact that the patient receives more support from his/her network correlate with less outpatient hospital admissions in the course of three years after the first admission.
2. A larger extra-familial network is correlated with more outpatient hospitalisations and longer stays at the ward.

3. No correlation has been found between the features of social network and the duration of hospitalisations, the number of relapses and the course of the illness.

The social level

Correlation between the features of social networks and treatment outcome at the social level was analysed according to the four selected criteria.

Table 3

Correlation between features of social networks and treatment outcome at the social level three years after first admission

Treatment outcome: social level	Type of support system (concentrated dispersed, mixed) ↑	Age of network ↓	Size of network ↓	Amount of support ↓	Localisation of support ↓	Size of network outside family ↑
Social Activity Scale	0.15	0.20	-0.26	-0.09	-0.22	0.29**
Employment	0.19	0.18	0.12	0.09	0.04	0.18
Social functioning according to DSM-III	0.34*	-0.03	0.14	-0.24*	-0.19	0.55**
Social contacts (clinical evaluation)	0.32*	-0.28*	-0.30**	-0.37**	-0.33**	0.24*

* $p < 0.05$

** $p < 0.01$ measured with Spearman's correlation coefficient

The following correlation was found:

1. Some features of social networks (age of network, size of network outside family, amount and localisation of support) are positively correlated with social functioning according to DSM-III.
2. The features of social networks are positively correlated with broader social contacts, which means that when a patient has a larger social network, more support in the family and outside the family, remains in more stable relationships in the network and has a mixed support system, he/she has broader social contacts.
3. No correlation has been found between the features of social networks and employment.

Discussion

Some statistically significant findings were obtained concerning the correlation between the type of social network and treatment aims that were adopted in the therapeutic programme. The patients who have a mixed type of support system have a better motivation for treatment, are more compliant, have a better insight in the illness, and, subjectively, are more satisfied with treatment. These results point to the

type of support system that is especially advantageous for schizophrenic patients in the first years of the illness.

A mixed support system is the one that encompasses persons who satisfy several different needs of the patient (e.g. his/her system includes a confidant who also does small household repairs) as well as those who satisfy his/her particular needs (e.g. the patient has an acquaintance from whom he/she only borrows money). In the literature of the subject we have not found any clear correlation between the type of support system and treatment outcome. In international studies on the course of schizophrenia, for instance in the WHO studies [11], an important factor, predictive of a negative course of schizophrenia, proved to be a low index social contacts, which was described by the term 'social isolation'. Because a mixed type of support system is strongly correlated with the number of extra-familial relationships, it may be a favourable factor in the prognosis of the course of schizophrenia. This hypothesis needs to be verified in future follow-up studies.

The results of the study show as well that *if the patient's support system, based on the family, is more mixed, the patient has a better insight in the illness*. The confirmation can be found in the reports by Beels [1], which describe the correlation between the family's acceptance of the illness and a good prognosis in schizophrenia, including the possibility of getting a better insight by the patient.

There exists also a strong, statistically significant *correlation between psychopathology and some features of the social network*. Patients with smaller networks, including extra-familial networks, have more positive symptoms. Patients with small networks that give little support, localised mainly in the family, have more negative symptoms. The above data are confirmed in the studies by Hammer, which mention a correlation between the network's size and type of relationships, and the number of psychotic symptoms [7].

There occurs a statistically significant *correlation between treatment outcome (e.g. number of outpatient hospitalisations in three years) and the type of network and the amount of support*. Patients with a mixed support system, that is those who have in their system one person that satisfies particular needs and receive much support from their network, chiefly extra-familial, have more outpatient hospitalisations in three years. Thus the stay in an outpatient ward is longer for those patients who have a large extra-familial network. Perhaps this type of network protects patients against inpatient treatment, which stresses the appropriateness of the community treatment programme. Then the purpose of the outpatient ward and other forms of community treatment appear to be the building of the social network (relationships with patients and therapists, clubs), and especially the building of a mixed support system.

No correlation was observed between the features of the social network and employment. These are partly independent research areas, which can partly account for this result. We find a confirmation in the study by Strauss and Carpenter [12]. Their study proves, among others, that employment, social functioning and coping with symptoms are relatively independent areas, independent enough not to become mutually predictive. For instance the fact that the patient was successful at work before onset may influence his/her good social functioning at work after his/her illness, but it will not influence social contacts and social network.

There occurs a correlation between the features of the social network and social functioning according to DSM-III. The assessment of the latter is a complex construct and encompasses social contacts, professional activity and leisure activities. Patients with a small network, based mainly in the family, from which they derive little support, as well as those who maintain short-term relationships in their network, function socially worse in the first three years of the illness.

Many studies, e.g. by McGlashan [13], show that in the first decade of the illness its course is determined chiefly by social factors. Only when the dynamics of this phenomenon are examined, a broader analysis of the described correlation will be possible.

Conclusions

1. The type of support that is offered to the schizophrenic patient by his/her social network is of utmost significance. Patients with a mixed support system in their social networks have more insight into the illness, are better motivated for treatment, are more satisfied with treatment, and they show more compliance in taking medication. The type of support system may be a prognostic factor in the course of schizophrenia.
2. A correlation exists between some parameters of the social network and psychopathology. The intensity of the negative syndrome is positively correlated with the patient's small, concentrated network, which gives him/her little support. The intensity of positive symptoms is correlated with a smaller size of the social network and smaller extra-familial network.
3. Social functioning at work and the features of the social network are independent, uncorrelated social domains.

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