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The influence of early psychosocial intervention on the long-term clinical outcomes of people suffering from schizophrenia

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Summary

Aim. To compare the treatment outcomes of DSM-IV-TR schizophrenia patients in either a Community Treatment Program or an Individual Treatment Program (CTP vs. ITP). The assessment was made after the first hospitalization, and then after three and twelve years.

Method. Participants were randomly assigned to CTP (experimental) and ITP (traditional) group, with 40 people in each group. 67 people (84%) participated in all three assessments. The socio-demographic and clinical indicators were the same for both groups. In the first three years only the CTP group participated in day-care treatment, patient and family psychoeducation and community treatment. Later, both groups received this treatment. The following tools were used: Anamnestic and Catamnestic Questionnaire, the GAF scale, the BPRS LA and Lehman's Quality of Life Interview.

Results. It was only after twelve years that there was a significant beneficial improvement in the mean GAF score in the CTP group ($p = 0.036$), which was comparable with the results obtained by Watt and Shepherd for the course of the illness in favorable remission cases ($p = 0.038$). The difference in the number of relapses was also significantly in favor of the CTP group only after 12 years ($p = 0.045$), as was the difference in the number of rehospitalizations ($p = 0.013$). The general severity of symptoms was found to be significantly lower for the CPT group after 3 ($p = 0.008$) and 12 years ($p = 0.030$), whereas it was significantly lower in the case of positive syndrome only after 3 years ($p = 0.044$).

Conclusions. 1. A greater number of favorable differences were identified for the CTP group at the twelve-year point than at the conclusion of the experiment. 2. The three-year

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delay in introducing psycho-social treatment was associated with a poorer long-term outcome for the clinical course of schizophrenia.

Key words: schizophrenia, early psychosocial intervention, long-term outcomes

Introduction

While the impact of socio-demographic and clinical factors on the course of schizophrenia has been confirmed in many previous studies, the answer to the question about the impact of therapeutic programs on long-term outcomes of treatment leaves many ambiguities [1, 2]. In a review of research on the impact of therapeutic interventions on outcomes in schizophrenia Penn et al. [3] categorized them in four areas: the impact of pharmacological treatment, the impact of individual psychotherapy, group and family psychotherapy and the impact of comprehensive treatment programs. Our research focuses on the impact of a comprehensive, community therapeutic program on long-term clinical outcome.

In previous studies, therapeutic programs for patients with diagnosed schizophrenia including psychoeducation of families and social skills training were compared most often with the more poorly assessed "as usual" therapy, but the observed differences disappeared with longer observation periods [4–7]. Studies assessing comprehensive psychosocial interventions such as the Dutch study by Linszen et al. [8], the Danish OPUS described by several authors [9–12], the Norwegian study by Sigrunarson et al. [13] and the Canadian-English study by Norman et al. [14] were similar to the Krakow study [15, 16] in that they were more extensive. The research is methodologically diverse which makes any comparison difficult. The researchers either differentiated or not a sub-group of schizophrenia sufferers from the group of non-affective psychosis, constructed a program of diverse duration and contents, introduced a control group or not and selected various indicators of treatment outcomes and time to assess their durability in long-term follow up studies. Further evidence was collected that early psychotherapeutic intervention, psychoeducation and comprehensive approach can improve the early, but not always the long-term outcomes of the treatment of schizophrenia, as the benefits between the experimental and control groups in experimental studies, if there were any, disappeared within a few years after the completion of the program.

Therapeutic programs and the subsequent follow up studies to assess the durability of the obtained outcomes were of different duration. They included 15 months in the Dutch study by Linszen et al. [8] concluded with a five-year follow up, two years in the OPUS program with a five-year follow up described by Rosenbaum et al. [11] and Nordentoft et al. [9], two years in the Norwegian program by Sigrunarson et al. [13] with a twelve-year follow up and the five-year program by Norman et al. [14] in Canada and England where there was no control group. In the last case, the benefits were observed in a group covered by an extended program when compared with the Danish OPUS. After the completion of the programs, the patients underwent traditional treatment and "as usual" care. They included, like in the case of the Krakow program [16], family psychoeducation, social training, individual psychotherapy and

other psychosocial interventions. In the five-year follow up for OPUS Rosenbaum et al. [11], and in the 12-year follow up Sigrunarson et al. [13] found that most of the positive outcomes of treatment disappeared. Only slight positive effects remained in the Danish OPUS studies in favor of the experimental group which reported shorter hospital readmission periods and fewer patients relying on assisted housing. Concluding their research, Bertelsen et al. [12] and Linszen et al. [8] are of the opinion that early psychosocial intervention is not as important for a positive outcome as continuity of care outside the hospital involving regular individual contact, family support, help in dealing with the illness, with drug therapy and with stress. The study by Norman et al. [14] focuses on the assessment of treatment outcomes in patients under a continuous comprehensive, five-year therapeutic program of diverse intensity. The psychosocial program was implemented in Ontario and London (PEPP). The results assessed after two and five years were stably positive and were compared with the results of the Danish program. After two years a significant difference in favor of the OPUS program compared with PEPP was reported in the assessment of the global functioning in GAF scale and less severe negative syndromes. After five years, the difference in the intensity of the negative syndrome disappeared and PEPP proved to be more beneficial in the GAF scale assessment and displayed less severe positive symptoms.

The aim and course of the study

In the course of the first hospital admission (index hospitalization) two groups of 40 inhabitants of Krakow suffering from schizophrenia diagnosed according to DSM-IV-CR were enrolled in the study. Psychoorganic disorders and addictions were excluded. The assessment was carried out by two experienced clinicians. The assessment was conducted at the time of the first psychiatric hospital admission, at the end of the clinical experiment after three years and the long-term, twelve-year follow up.

The Krakow study is a combination of a typical follow-up study and an experimental study in which the experimental group was treated in the community treatment program (CTP) and the control group in the individual treatment program (ITP). Enrolment to both groups was conducted at random. After the first psychiatric hospital admission patients in the ITP control group remained under individual care while the ones from the CTP experimental group were sent to a day ward and group treatment in communities such as psychoeducation, group psychotherapy, therapeutic camps, hostel. Families attended group psychoeducation for families and then joined a group which included the patients. In both groups optimal doses of neuroleptics were monitored. For greater clarity, the following research model was developed (Figure 1).

Any differences in the long-term treatment outcomes were attributed to early psychosocial interventions in the first three years following the onset of psychosis. For the next nine years, patients in both groups were provided with the same forms of community treatment with assured continuity of individual care and drug treatment with one therapist. The following research aims were adopted:

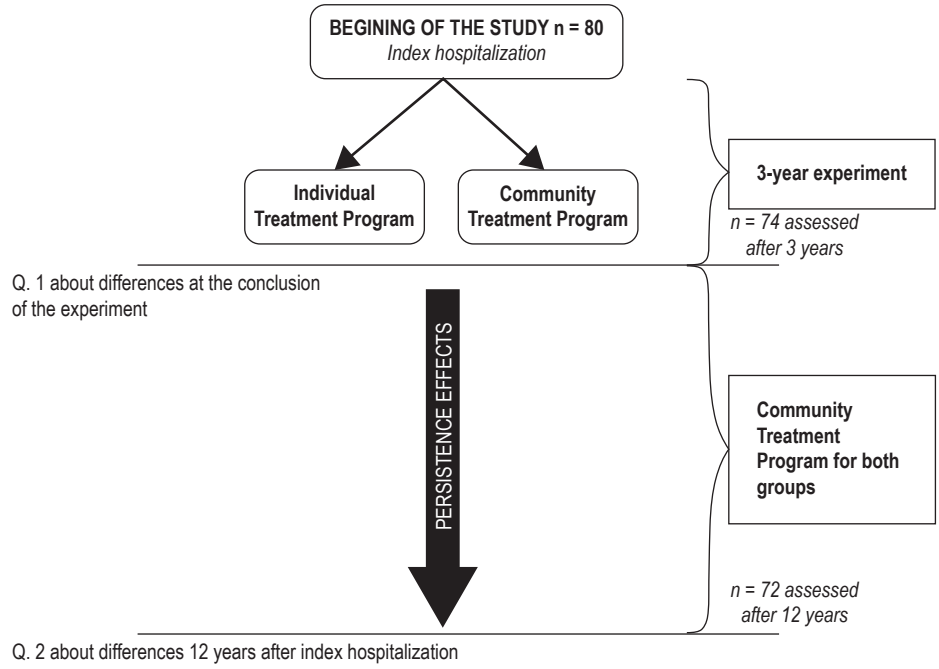


Figure 1. **Research model**

1. Assessment of clinical treatment outcome in community and individual therapeutic program at the completion of the clinical experiment three years after the first hospital admission;
2. Assessment of the stability of treatment outcomes in a long-term, twelve-year follow up.

The treatment outcome assessment took into account multidimensionality, the dynamics of change over the twelve years from the end of the first hospital admission which made it possible to trace the impact of the therapeutic program both on its direct assessment at the time of its completion as well as on the long-term image of schizophrenia in three and twelve-year follow up.

Material

Those who participated in all assessments included 33 patients from the CTP group and 34 from the ITP, i.e., 84% of the group which had qualified for the study (Table 1).

Table 1. **Study group characteristics**

Group characteristic	CTP n = 33	ITP n = 34
Age at index hospitalization		
Mean	27.42	25.85
Stand. dev.	5.55	6.07
Sex**		
Women	19 (58%)	19 (56%)
Men	14 (42%)	15 (44%)
Marital status**		
Married	11 (33%)	11 (32%)
Education**		
Higher	10 (30.3%)	9 (26.5%)
Secondary and incomplete higher education	16 (48.5%)	17 (50.0%)
Vocational	6 (18.2%)	6 (18.7%)
Primary	1 (3.0%)	2 (6.9%)
EE (Expressed Emotions)**		
Low	10 (34%)	8 (27%)
High	19 (66%)	22 (73%)
DUP (Duration of Untreated Psychosis)*		
Mean	39.39 weeks	42.68 weeks
Stand. dev	84.10	67.30
Illness in first- and second-degree relatives		
present**	10 (30%)	12 (35%)

Differences between the groups measured by * Student's t-test; ** Mann-Whitney U test are statistically insignificant

In the study group the proportion of men and women was similar, with similar distribution of education. What strikes here is a relatively high percentage of marriages, a relatively long average duration of untreated psychosis and a similar degree of heredity between close relatives.

Tools and methods

The Anamnestic and Catmnestic Chart, the GAF scale, the Watt and Shepherd scale, and the BPRS LA scale of illness course (Brief Psychiatric Rating Scale, version modified in UCLA by Lukoff et al.) were used. An assessment of differences in quality of life using the Lehman questionnaire was conducted in a separate study. To measure the significance of differences between the groups Student's t-test, Mann-Whitney U test, χ^2 test and analysis of variance were used. Calculations were performed using STATISTICA 10PL.

Study results

Two general results will be first presented in the form of the GAF scale and next detailed clinical indicators, including the number of relapses, the number and duration of readmissions and severity of symptoms.

General results in CTP and ITP measured in the GAF scale

The difference after three years between the mean scores in the GAF scale (62.8 vs. 58.1 points) measured using the Student's t-test was not significant and after 12 years (66.8 vs. 58.4 points) it reached significant level ($p = 0.036$). Similarly, in case of the division into different levels of functioning assessed by the GAF scale, a visible but not statistically significant difference in favor of the CTP after three years changed to a significant one at the completion of various programs after twelve years ($p = 0.018$). The favorable long-term outcome appears in the CTP group although the program was the same for both groups over the next nine years (Figure 2a and 2b).

Other important information is obtained from an analysis of the various point ranges in the scale. Two detailed results need to be discussed. If a positive treatment outcome is assumed > 61 points in the GAF scale, then after three years at the end of the program it is obtained by 61% of the patients in the CTP and 42% in the ITP. This represents a 19 percentage point difference. The difference increases to 26% after twelve years (64% vs. 38%), although both groups for many years participated in the same forms of community treatment. What is even more distinctive is the gradually growing dominance in the CTP of a group who recover (> 70 pt., GAF), which after three years was 7% (28% vs. 21%) and after twelve years amounted to 26% (43% vs. 17 %), which is a significant difference measured by the χ^2 test ($p = 0.027$)

Types of illness course according to Watt and Shepherd in the CTP and ITP

Types of schizophrenia course based on Watt and Shepherd criteria (1989) are constructed in such a way that the first two treatment outcomes rated as "*favorable*" are characterized by remission of symptoms and thus indicate a phasic course of illness while the other two indicate gradual persistent illness-related changes. The phasic, favorable course of schizophrenia with remission of symptoms assessed as a positive outcome in the three-year follow up is obtained by 48% of patients in CTP and 32% of ITP which gives a 16% difference, which increases after twelve years to 26% (58% for CTP and 32% for ITP). Differences between groups after three years are insignificant, but this changes in favor of CTP after twelve years ($p = 0.038$) (Figure 3a and 3b).

After twelve years the difference in the subgroup with one psychosis episode (type 1) increased to 22%. The 31% in CTP is evidently higher than 9% in ITP. After twelve years a 26% difference remains between the groups with the worst course: 42% in CTP and 68% in a subgroup of ITP.

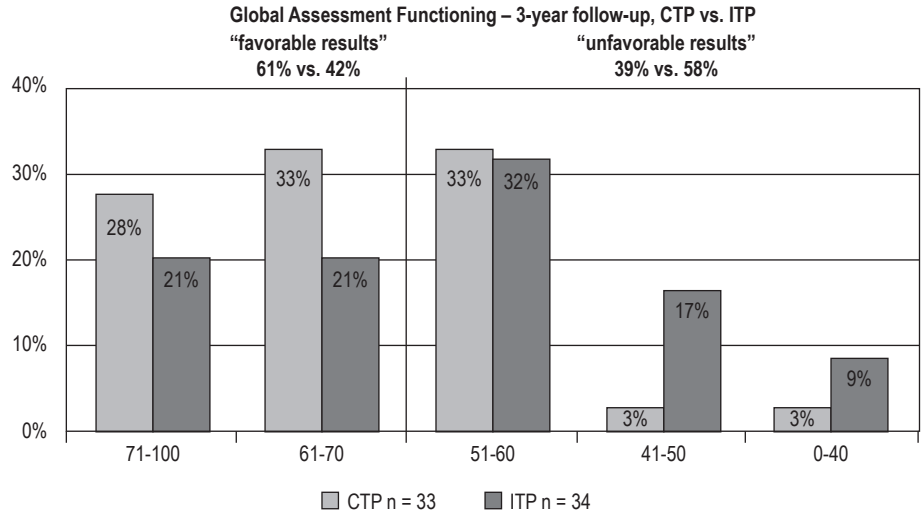


Figure 2a

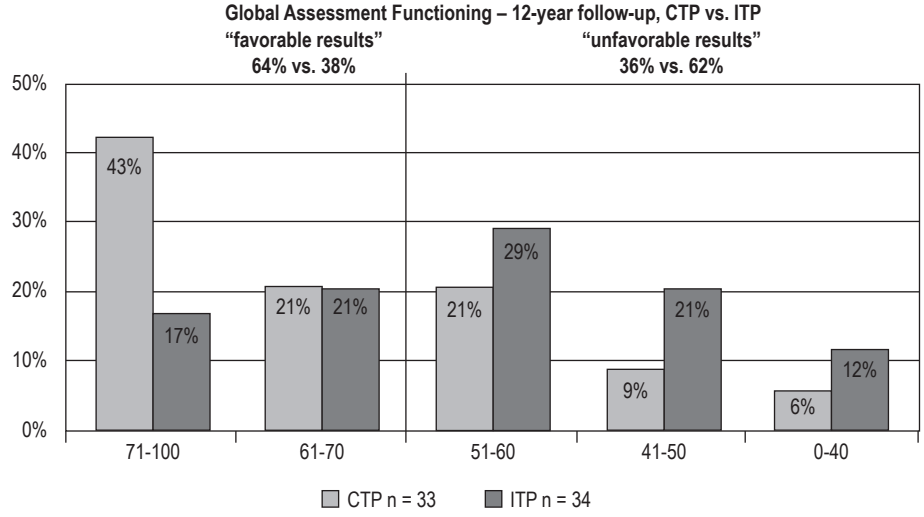


Figure 2b

Figure 2a and 2b. **Point range assessment in the GAF scale following three and twelve years**

The mean difference between the groups as measured by the Mann-Whitney U test after three years: NS, after twelve years p = 0.018

Relapses in CTP and ITP

After three years 64% in CTP vs. 38% in ITP and after twelve years 33% vs. 9% of patients did not experience a relapse. After three years the difference between the

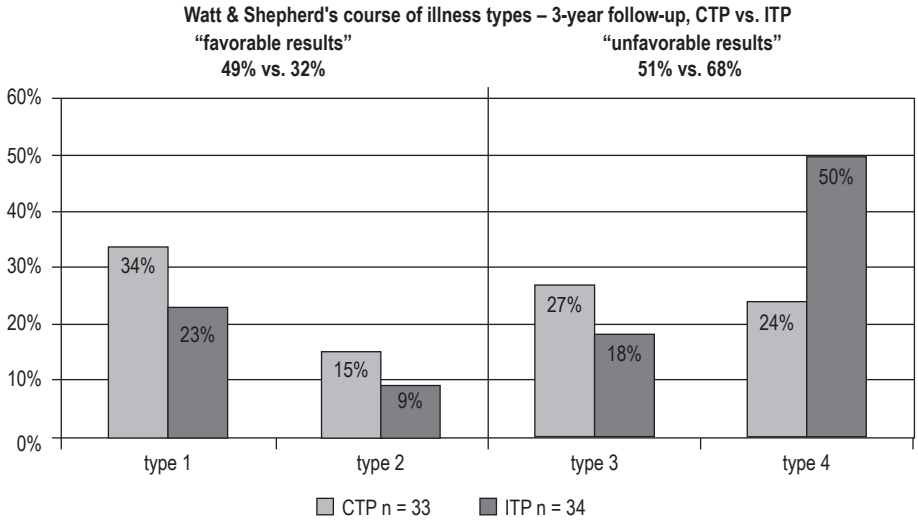


Figure 3a

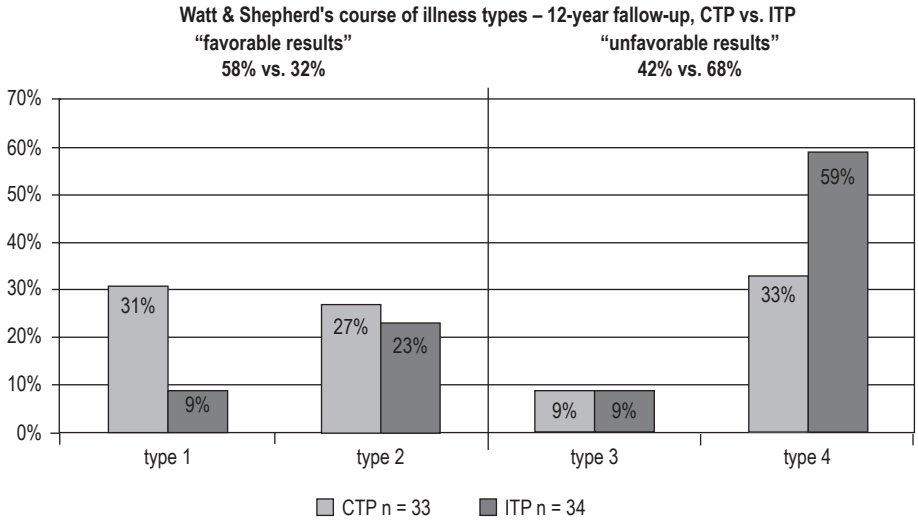


Figure 3b

Figure 3a and 3b. **Types of illness course according to Watt and Shepherd after three and twelve years, also divided into favorable and unfavorable outcomes.**

Differences between the groups measured by the Mann-Whitney U test after three years are NS, after twelve years, $p = 0.038$

groups was 26% and after twelve years 24% in favor of CTP. Eventually, the differences between the groups after twelve years were significantly more favorable in CTP ($p = 0.045$), (Figure 4a and 4b).

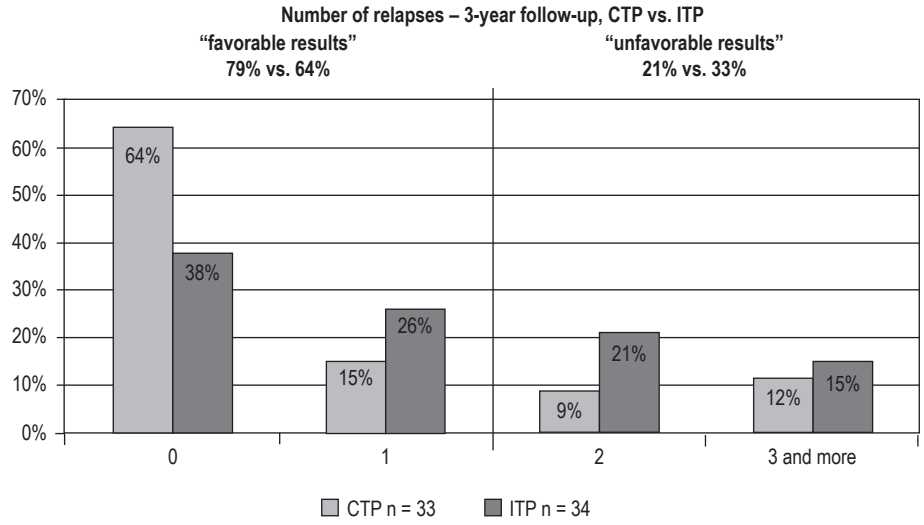


Figure 4a

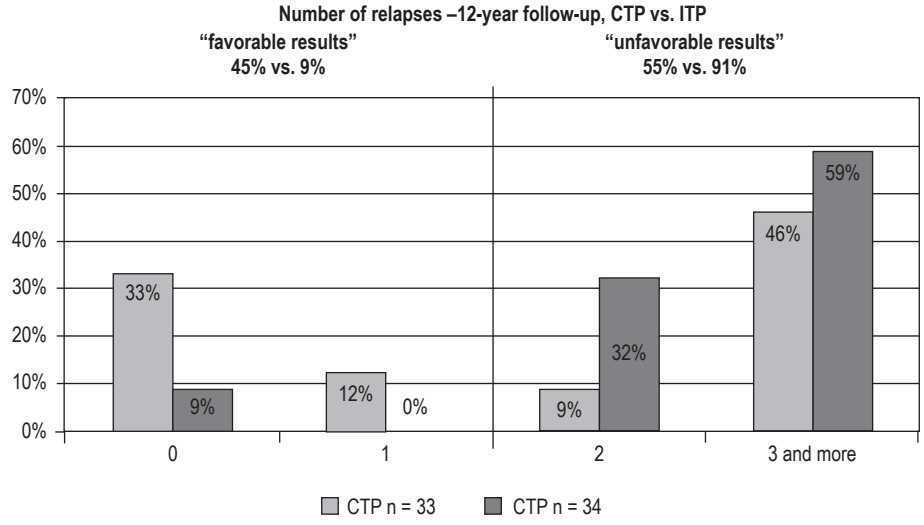


Figure 4b

Figure 4a and 4b. **The number of relapses after three and twelve years – a comparison of CTP and ITP groups**

Differences between the groups were measured by the Mann-Whitney U test ($p = 0.045$).

An analysis of the favorable outcome with the criterion of "absence of relapses or one relapse" is valuable from the cognitive point of view. After three years a difference

of 15 percentage points was found (79% vs. 64%), which increased to 36% percentage points (45% vs. 9%) after twelve years.

A variance analysis was conducted to assess the significance of differences in the mean number of relapses between CTP and ITP groups and the interaction between the group type and duration of the study. No significant differences were found. Comparison was also performed between absence of relapses vs. present relapse and to one or more relapses (Table. 2).

Table 2. **Dichotomous division in the system absence of relapses vs. present relapses and 0–1 vs. more relapses**

Significance of differences between CTP and ITP		
Follow-up	Absence of relapses vs. present relapses	0–1 vs. more relapses
After 3 years	p = 0.038*	ns*
After 12 years	p = 0.014**	p = 0.001**

*χ^2 test; **F-test

Analyses of the groups indicate better scores of the CTP which remain stable and increase after twelve years (p = 0.014 and p = 0.001).

Readmissions in the CTP and ITP

Analyzing full-time readmissions during the twelve years of follow-up and comparing the results for the two groups, some valuable cognitive phenomena were found. An analysis of a favorable treatment outcome, including the group without readmission and one with readmission vs. more readmissions indicates a growing lead of CTP after twelve years with 67% vs. t 38% in the ITP (Figure 5a and 5b).

In an unfavorable outcome with numerous readmissions the individual program gets a higher score of 62% vs. 33%. Generally, a lower number of readmission in the CTP reaches a significant level after twelve years (p = 0.013). The results of the variance analysis to assess the significance of differences in the mean number of readmissions among the CTP and ITP groups and interactions between the group type and duration of the study proved to be insignificant.

Dichotomous comparisons – absence of readmissions vs. present readmission and absence or 1 readmission vs. more readmissions showed significant differences in favor of the CTP after twelve years (table 3).

Table 3. **Dichotomous division in the system absence of readmissions vs. present readmission and 0–1 readmission vs. more readmissions**

Significance of differences between CTP and ITP		
Follow-up	absence of readmissions vs. present readmission	0–1 readmission vs. more readmissions
After 3 years	ns*	ns*
After 12 years	p = 0.008*	p = 0.020*

*χ^2 test

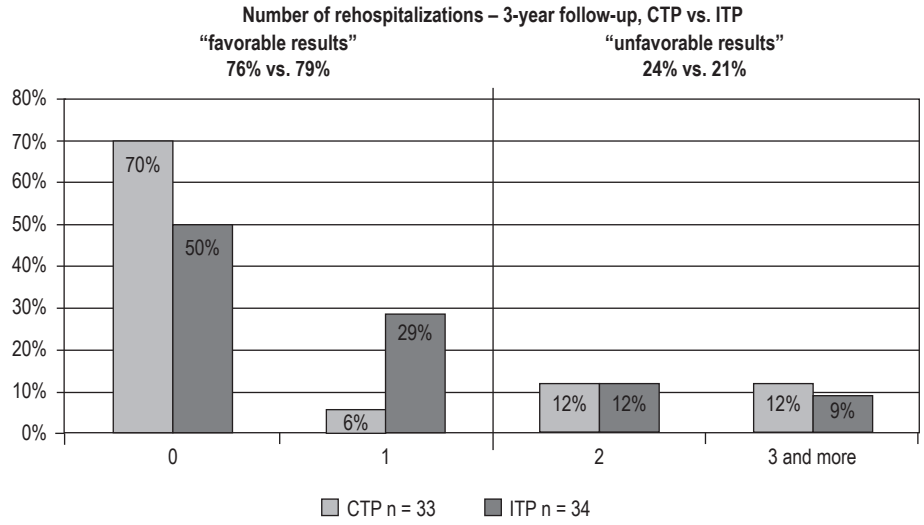
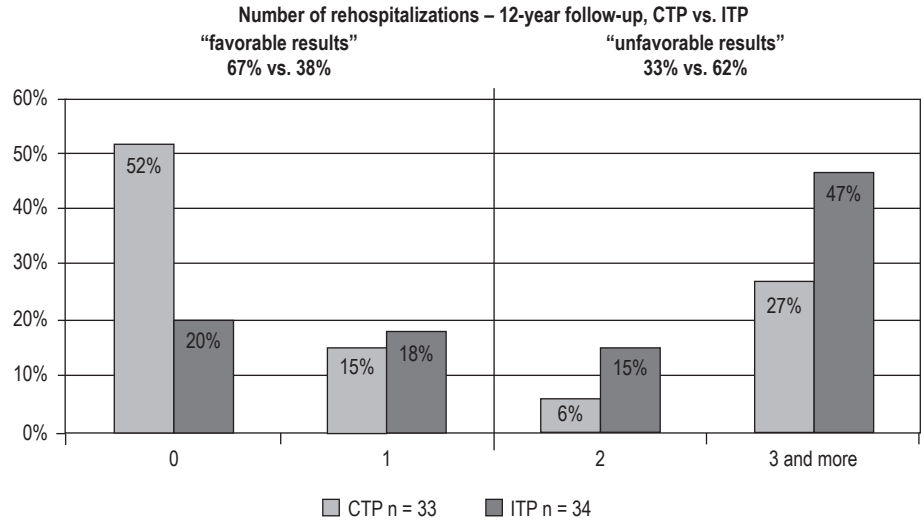


Figure 5a



Rysunek 5b

Figure 5a and 5b. **Number of readmissions in a period of 3 and 12 years – a comparison between the CTP and ITP groups**

Differences between the groups were measured using the Mann-Whitney U test after 3 years NS, after 12 years, $p = 0.013$.

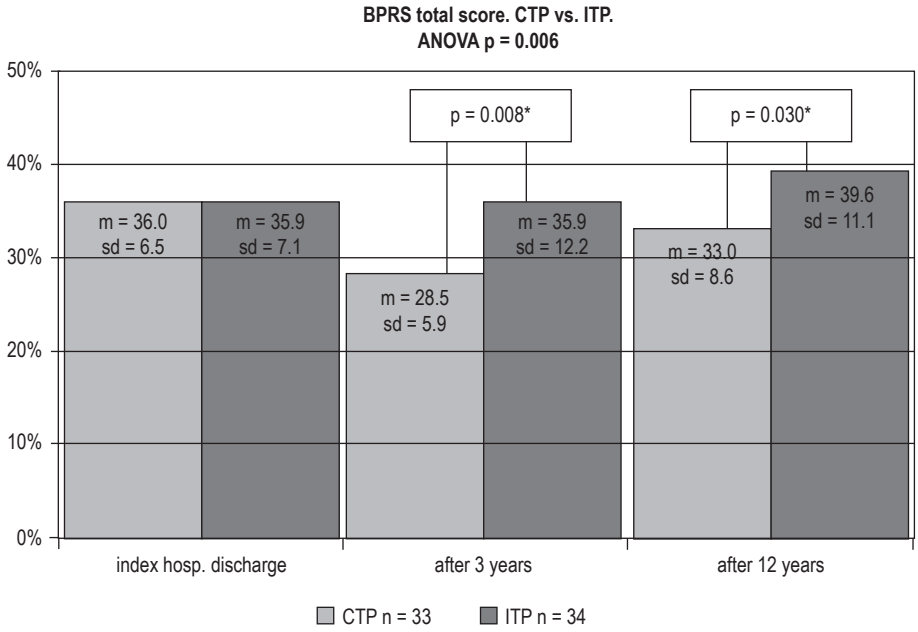


Figure 6. **The dynamics of the severity of symptoms according to the BPRS scale at subsequent measurement periods – a comparison of the CTP and ITP groups**

*Tukey's post-hoc test

The dynamics of the general severity of symptoms in the CTP and ITP

The dynamics of psychopathological symptoms in subsequent years of the follow-up based on the BPRS scale in both groups was monitored. Below is a figure presenting the average severity of general symptoms. The assessment was made at three measurement periods: at the discharge from full-time hospital admission, after three years and after twelve years (Figure 6).

An analysis of variance for the total BPRS scale indicated a significant interaction effect between measurement time and the group ($p = 0.006$). If there was no difference between the CTP and ITP groups in the initial test, such differences, lower severity of symptoms occurred after three and twelve years in favor of CTP (Tukey's post-hoc test results: $p = 0.008$ and 0.030, respectively)

The dynamics of positive and negative syndrome symptoms in the CTP and ITP

The average severity of positive and negative symptoms in the BPRS sub-scales is presented below (Figure 7a and 7b).

An analysis of variance for the positive symptoms according to the BPRS scale indicated a significant interaction effect between measurement time and the group

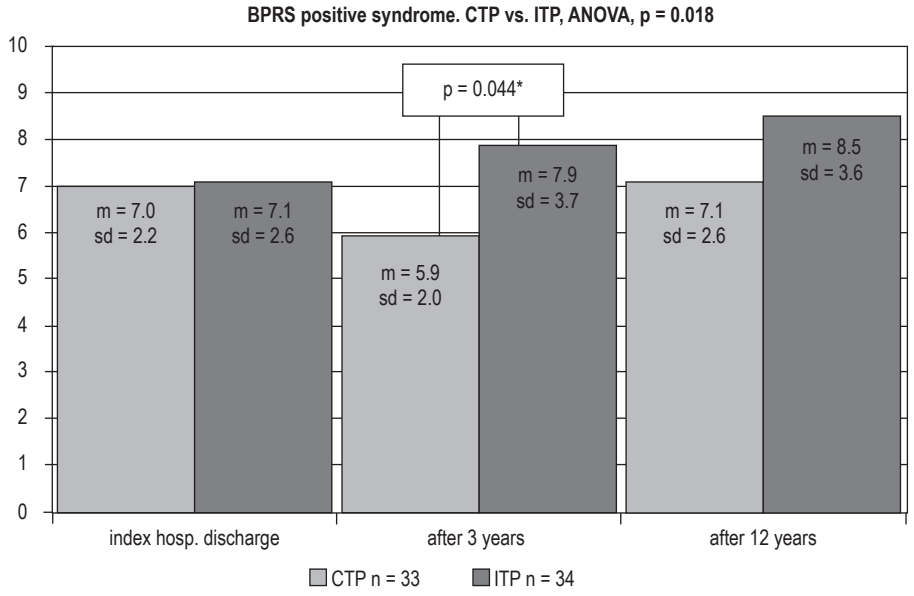


Figure 7a

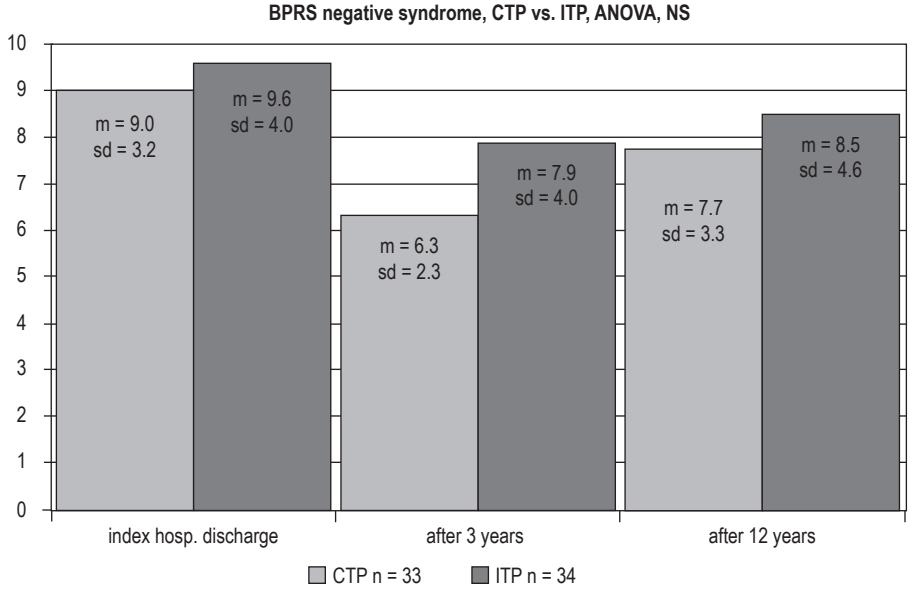


Figure 7b

Figure 7a and 7b. **The dynamics of positive and negative syndrome symptoms according to the BPRS scale at the subsequent measurement periods – a comparison of the CTP and ITP groups**

*Tukey's post-hoc test

($p = 0.018$). If there was no difference between the CTP and ITP groups in the initial test, such differences occurred after three years in favor of CTP (Tukey's post-hoc test results: $p = 0.044$) which had lower symptom severity at the time of completion of the program, losing statistical significance after twelve years, but maintaining the same change trend.

It was observed that the severity of the negative syndrome in CTP decreased during the program and increased after twelve years without reaching the level from the period after the first full-time hospital admission. In the ITP the dynamics of the negative syndrome was similar, but although its severity was higher, in the analysis of differences between the CTP and ITP groups and the interaction between measurement time and the group for the results of negative symptoms in the BPRS scale, the Tukey's post hoc test indicated no significant differences.

Discussion

The aim of the study was to assess the effectiveness of a psychosocial treatment program for schizophrenia sufferers and their families developed over the last thirty years by Krakow psychiatrists [16]. A clinical experiment was therefore conducted analogously to several similar programs to assess a comprehensive approach with a comparison group of patients who, following initial hospital admission, remained in the individual care of experienced clinicians and therapists (ITP), who had treated them earlier during full-time hospital stay and provided the best pharmacological and psychological care. As both programs included individual care and pharmacotherapy, possible differences in results should be attributed to the experimental group's participation in the community treatment program (CTP). It included the continuation of treatment in a day ward followed by individual psychotherapy and participation in outpatient groups: discussion, theatre, arts, stays in therapeutic hostels, therapeutic camps and other social activities depending on individual needs. Simultaneously, educational and therapeutic groups for families were also conducted. In the CTP group stability of relationships was also sought, but more often than in the CTP, the main carer apart from doctors were psychologists and nurses while doctors were consulted only about the administration of medication.

In our study a positive direct impact of participation in the community program assessed after three years at the time of completion of the program is expressed by percentage and severity of positive symptoms. Such a direct beneficial effect was also noted by comprehensive psychosocial interventions of the Dutch study by Linszen et al., Danish OPUS study by Nordentoft et al., Petersen et al., Rosenbaum et al., and Bertelsen et al., Norwegian study by Sigrunarson et al., and Canadian-English study by Norman et al. However, unlike these researchers, in the Krakow study most indicators of favorable course of schizophrenia indicate a significant impact of early social intervention only in long-term assessment after twelve years of illness. Favorable mean results in the GAF scale after twelve rather than just three years were significantly higher for the CTP group ($p = 0.036$), like the difference in the group of patients who recover (GAF > 70 pts, $p = 0.027$), favorable types of illness course with remission

according to Watt and Shepherd ($p = 0.038$), difference in the number of relapses ($p = 0.045$) and the number of readmissions ($p = 0.013$). Significantly lower, general severity of symptoms in the CTP was assessed after three ($p = 0.008$) and twelve years ($p = 0.030$) and in the positive syndrome only after three years ($p = 0.044$).

Both assessments of subgroups with a negative course indicate that social intervention during the first three years of illness, not only increased the sub-group with the best course of schizophrenia, but after twelve years reduced the sub-group of particularly unfavorable course from 33% to 15% (below 50 points in the GAF scale) and from 59% to 33% in the course assessment type by Watt and Shepherd. This 33% unfavorable course assessment although still very high, is better than that in an Indian study by Thara et al. [17], who in a ten-year follow up found 42% of cases with very unfavorable fourth type of course with increasing severity of symptoms. This difference between our and the Indian study is all the more noteworthy since, according to a WHO, study by Sartorius et al. [18] and Hopper et al. [19] it is known that the results were assessed as more favorable in developing countries.

In the study by Linszen et al. of 63 patients, 23% did not suffer from a relapse after five years from the onset of the illness. In the Krakow study after twelve years, 33% of the patients had no relapses. In the remaining group, Linszen et al. reported a 52% subgroup with one relapse, in our study it was 45% after twelve years.

In the community program after 12 years a significant difference in the number of readmissions was found in both the group without and with one readmission. After twelve years 52% of the patients in the community program avoided full-time readmission compared to 20% in the individual program and 67% constitute a group without or with only one readmission. In Sigrunarson's twelve-year follow up, the results on readmission, the number of days spent in hospital, the amount of readmissions indicate no difference between patients in the "as usual" program and the results of the group who for the first two years participated in a psychosocial treatment program. The Krakow community program apparently protects sufferers from hospital treatment.

When analyzing the total symptom severity, lower severity was found both after three and twelve years in favor of the CTP. This was due to favorable impact of the community program on the result of positive symptoms, but not the negative syndrome.

In the Danish five-year follow up by Bertelsen and Nordentoft [9, 12] patients receiving a comprehensive range of community treatment (OPUS) for the first two years had, like in the Krakow study after twelve years, fewer days of full-time hospital admissions and were less dependent on assisted housing than patients who received hospital rehabilitation. However, the level of psychopathology in their study after five years reached similar levels in both groups. In turn, in the twelve-year follow up by Sigrunarson et al. [13], most of the positive results obtained after the first years of the psychosocial program disappeared.

Thus, in our study, most of the treatment outcomes which showed the benefits after three years of the program, in the long-term twelve-year follow up reached statistically significant levels. Thus, our results do not confirm previous results of the Dutch study by Linszen and the Norwegian study by Singrunarson et al., because we must conclude that early, comprehensive psychosocial intervention has a positive

impact not only on early, but also on long-term outcomes of schizophrenia sufferers. Perhaps an important role is played here by each and every year of extended program duration and the fact that the psychosocial program for both groups of patients was continued in the following years. One of the Linszen's conclusions was an indication of the necessity to continue psychosocial interventions over many subsequent years of illness. Such an opportunity of having access to a comprehensive therapy for five years was also offered by the Canadian program of Norman et al. Probably both early intervention and a long-term continuous program in the community are important. Both the Canadian program and our results demonstrate the value of early psychosocial intervention. The implementation of this program in Poland is still awaiting systemic solutions.

Conclusions

1. In the treatment group with the psychosocial program more beneficial differences were found after twelve years from the first hospital admission than at the time of program completion.
2. People suffering from schizophrenia and participating in community treatment program, when assessed after 12 years of treatment, were characterized by a better level of functioning, as well as, in the observation period, had fewer relapses and rehospitalizations and a lower severity of psychopathological symptoms.
3. Delaying psychosocial treatment in the first three years of illness is associated with a worse long-term, clinical course of schizophrenia after twelve years.

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