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Community-oriented family-based intervention superior to standard treatment in improving depression, hopelessness and functioning among adolescents with any psychosis-risk symptoms

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ABSTRACT

The aim of the present study was to compare change in functioning, affective symptoms and level of psychosis-risk symptoms in symptomatic adolescents who were treated either in an early intervention programme based on a need-adapted Family- and Community-orientated integrative Treatment Model (FCTM) or in standard adolescent psychiatric treatment (Treatment As Usual, TAU). 28 pairs were matched by length of follow-up, gender, age, and baseline functioning. At one year after the start of treatment, the matched groups were compared on change in functioning (GAF-M), five psychosis-risk dimensions of the Structured Interview for Psychosis-Risk Syndromes (SIPS), and self-reported anxiety, depression, and hopelessness symptoms (BAI, BDI-II, BHS). FCTM was more effective in improving functioning (20% vs. 6% improvement on GAF-M), as well as self-reported depression (53% vs. 14% improvement on BDI-II) and hopelessness (41% vs. 3% improvement on BHS). However, for psychosis-risk symptoms and anxiety symptoms, effectiveness differences between treatment models did not reach statistical significance. To conclude, in the present study, we found greater improvement in functioning and self-reported depression and hopelessness among adolescents who received a need-adapted Family- and Community-orientated integrative Treatment than among those who were treated in standard adolescent psychiatry.

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1. Introduction

Early detection and intervention have been shown to be beneficial to young people in the at-risk state for psychosis, and during the last decade many early intervention services have been implemented around the world (McGorry et al., 2002; Marshall and Rathbone, 2011; Bechdolf et al., 2012; Morrison et al., 2012; Stafford et al., 2013). These early intervention services are intended for young people who are seeking help for their first psychosis episode or for psychosis-risk symptoms. Young people seem to benefit from early intervention in the sense of psychosis symptom reduction, even though currently it is not clear if special treatment models can lead to lower conversion rates from the at-risk state to psychosis (Bechdolf et al., 2012; Morrison et al., 2012;

Stafford et al., 2013). Psychosis-risk symptoms are more prevalent in the general population of young people than in the part of the population which develops psychosis (Kaymaz et al., 2012), and a valid distinction between young people who are at risk and those who are not is difficult to make (Schimmelmann and Schulze-Lutter, 2012). Nevertheless, given that many adolescents seeking help with or without at-risk symptoms are in need of care, Schimmelmann and Schulze-Lutter (2012) have suggested that treatment is justified independent of conversion risk to psychosis as at-risk adolescents and their caregivers experience distress and impairment. At the moment, there is insufficient evidence to delineate appropriate strategies for early intervention (Schimmelmann and Schulze-Lutter, 2012). However, specific psychological treatment methods, such as cognitive behavioural therapy, seem to have a stronger effect on symptom reduction than standard treatment or supportive counselling (Stafford et al., 2013).

Psychological stress has been shown to have an impact on developing psychotic disorder according to the vulnerability-stress model of psychosis, which postulates that psychosis results

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from the combined effects of stress and trait-like vulnerability to psychosis (Zubin and Spring, 1977; Phillips et al., 2007). It has also been found that stress may generate other psychiatric symptoms, for example, depressive and anxiety disorders (Uliaszek et al., 2012). Loch et al. (2011) suggest that depression is present on a continuum of psychotic experiences; in their study, depression was present in a group of treatment-seeking subjects who had clinically relevant hallucinations and delusions, as well as in subjects who had no clinically relevant psychotic experiences.

Indeed, there is empirical evidence to suggest that emotional symptoms such as depression and anxiety may be intrinsic to the development of psychosis or may arise as a psychological reaction to psychotic symptoms (Nordström et al., 1995; Birchwood, 2003; Miller et al., 2003; Svirskis et al., 2005; Yung et al., 2008; Rietdijk et al., 2011; Marshall and Rathbone, 2011; Addington et al., 2011; Klonsky et al., 2012; Fusar-Poli et al., 2014). Perhaps even more clinically relevant is that an at-risk state is associated with a compromised level of functioning, as reflected by global assessment, and lowered general levels of functioning have been associated with increased risk for conversion to psychosis (Fusar-Poli et al., 2015).

Previous evidence suggests change in functioning – which is as important as symptom levels – among adolescents who are seeking help for psychiatric symptoms and who are treated in an early intervention service. However, the evidence is inconsistent as regards benefits resulting either from specific psychosocial or pharmacological treatment relative to standard or needs-based care. A pioneering Australian study (McGorry et al., 2002) of an early intervention treatment for subjects at clinical risk for psychosis reported an improvement in functioning in both a special treatment group (risperidone + cognitive behavioural therapy) and in a specific treatment group. Furthermore, no differences in the functioning ability of at-risk subjects who had received either cognitive therapy or monitoring were found after treatment in the multicentre study by Morrison et al. (2012). However, there was greater improvement in psychotic symptoms in the special treatment group (Morrison et al., 2012). Further, in a meta-analysis (Stafford et al., 2013) in which all available intervention studies (including antipsychotic medication, cognitive behavioural therapy, and omega-3 fatty acid supplement treatments) for psychosis risk were included, evidence of moderate quality indicated that cognitive therapy reduces transition to psychosis in at-risk subjects compared to standard treatment, and low- to very low-quality evidence for both omega-3 fatty acids and integrated therapy (individual cognitive behavioural therapy, cognitive remediation, group skills training and family treatment) showed reduced transition to psychosis at 12 months.

Family plays an important role in supporting adolescents (McFarlane et al., 2010), and thus family members' support to those who are undergoing adolescent psychiatric care is important. Family members need to know how to help and how to react in challenging situations (Wilson et al., 2010), but they also need the opportunity to express their own concerns about the family or the adolescent.

The emotional atmosphere in the family environment, parental attitudes, behaviour, and coping strategies are associated with functional outcomes and symptom expression in at-risk adolescents (O'Brien et al., 2008). In addition, a positive family environment predicts improvement in symptoms and social functioning among adolescents at imminent risk for onset of psychosis (O'Brien et al., 2006). Therefore, the family environment should be a specific target of treatment for individuals at risk for psychosis (Schlosser et al., 2010). Finally, previous studies have reported that adolescents with heightened risk of psychosis who seek help show significant improvement in psychotic experiences, quality of life, depression, anxiety, and hopelessness in a Family- and Community-orientated, need-adapted integrative treatment model (Granö et al., 2009, 2013, 2014).

A substantial group of studies shows that psychiatric symptoms are present in a continuum of psychotic symptoms (van Os et al., 2009). Furthermore, subsyndromal psychotic and emotional symptoms may be responsive to psychiatric treatment that focuses on stress reduction (Phillips et al., 2007). Our hypothesis was that stress-reducing care carried out in co-operation with family members in the community (schools, home) and with multidisciplinary workers from the community may have a stronger positive effect on the level of psychiatric symptoms and effectively supports functioning in help-seeking adolescents.

The aim of the present study was to assess change in functioning, level of psychosis-risk symptoms, as well as symptoms of anxiety, depression, and hopelessness in adolescents who participated in an early intervention and detection programme based on a Family- and Community-orientated treatment model. The idea was to compare the adolescents' improvement with a group of adolescents who were matched in age, follow-up time, and functioning and who received standard treatment (e.g. counselling and medication) in a secondary-care adolescent outpatient unit.

2. Methods

2.1. Procedure, interventions, and participants

2.1.1. Procedure

The participants were selected from two separate studies that investigated two different treatment approaches carried out in Finland, by two separate research institutions: a Family- and Community-orientated, need-adapted integrative Treatment Model (FCTM) and Treatment As Usual (TAU). The FCTM studied early detection and intervention in adolescents who were treated at primary care. The TAU study followed adolescents in standard secondary care, to collect information about the development of psychiatric symptoms in adolescents.

The baseline assessment time point was at the beginning of treatment and the follow-up assessment was scheduled after one year from the beginning of the treatment. This study presents the comparison of the outcomes of matched adolescents (Appendix 1) in the FCTM programme and in standard secondary psychiatric services. For the purpose of the present comparison, the FCTM study was designed in co-operation with the TAU study to have similar measurements and follow-up times. More specifically, we report the treatment outcome with respect to level of symptoms of clients in the FCTM intervention and their matched pairs in TAU in the secondary psychiatric services for adolescent outpatients.

2.1.2. Interventions

2.1.2.1. FCTM. FCTM (1 April 2009 to 31 October 2011) was designed as an early detection and intervention team and as a research project for adolescents at risk of developing psychosis. FCTM was a treatment model that integrated elements of family therapy, need-adapted treatment for psychosis by Alanen et al. (1991), Open Dialogue (Seikkula and Olson, 2003), and elements from cognitive behavioural therapy (for example, normalizing and psycho-education). It was based on community outreach and co-working with families of adolescents and primary health-care workers in the community (Table 1.). The catchment area consisted of five towns with a total population of half a million inhabitants.

The detection and intervention model of the FCTM team was originally developed by researchers from Helsinki University Central Hospital between the years 2006 and 2008 (Granö et al., 2009). The FCTM team was a multidisciplinary group consisting of psychiatric nurses, occupational therapists, psychologists, and a supervising psychiatrist. The FCTM team members met help-seeking adolescents who were between the ages of 12 and 22 in

Table 1
Description of content and structure in Family and Community Treatment Model (FCTM; N=28) and Treatment As Usual (TAU; N=28).

Meeting forms which are included in the treatment	TAU Percentage of clients	Mean number of meetings and treatment delay (median)	FCTM Percentage of clients (%)	Mean number of meetings and treatment delay (median)
Meetings at home	Not included		39.3	2.4 meetings (0)
Meetings in community at co-worker's office (e.g. school, social workers)	Not included		100	13 meetings (12.5)
Meetings at psychiatric clinics	100%		21.4	0.3 meetings (0)
Meetings together with community co-workers (e.g. school nurse, GP)	Not included		100	9.4 meetings (8)
Meetings together with parents	Included	1/treatment	96.4	6.2 meetings (5)
All meetings with the client, including assessments and therapy	100%	24.3 (22)	100	14.9 meetings (14.5)
Treatment delay (to start the treatment after the referral)		90.9 days (84)		18 days (11)

HPS values from clinic registers; due to censoring, the number of visits was estimated with multiple adjustment cell hot deck imputation for 20 cases.

their natural surroundings, e.g., at school or at home, along with their parents and a community co-worker, who had initially contacted the FCTM team about their client's unclear and unspecified mental health problems (community co-workers were usually primary care service providers outside the psychiatric services available at school, in health care, or through social services).

Any professional community worker could contact the FCTM team about a client; however, family members or the adolescents themselves could not contact the team directly, as adolescents were already treated as patients or clients in primary services. Community workers had been informed through flyers and training sessions about the FCTM team and early detection. The team had three main tasks: first, to identify a possible risk state of developing psychosis among help-seeking adolescents; second, to meet the client and family together with the community co-worker in order to find a way to reduce stress and support the client in overall functioning at school or at work; and third, to refer the client to appropriate psychiatric care if a mental health disorder severe enough to require it was detected (e.g. frank psychosis or severe suicidal behaviour). Hence, exclusion criteria for the study included other, ongoing psychiatric care or the acute need for psychiatric hospital care.

As an intervention programme, the FCTM worked independently of the secondary service systems, yet was a co-partner of the primary service. The treatment cornerstones of the FCTM model, which were present in each case, were as follows: (1) every adolescent was treated in co-operation with a community co-worker to help the individual reduce current and concrete stress factors, such as stopping bullying at school or arranging special support for learning difficulties at school. Co-workers had to remain partners with the FCTM team throughout the whole treatment; (2) family members participated in meetings, and discussions focused on reducing internal conflicts in the family and securing family support for the client; (3) meetings were carried out in the community or at home and not in psychiatric institutions in order to make the service more accessible and non-stigmatizing.

2.1.2.2. TAU. The TAU data were collected from public adolescent psychiatric units over a three-year period in two parts: from 1 January 2003 to 31 March 2004 and from 15 March 2007 to 31 December 2008. Health-care workers referred subjects to psychiatric care from primary care. A physician's referral was not required. TAU at the in- and outpatient units consisted of outpatient

visits and family visits to the clinic (Table 1.). The care was often performed by separate workers. No formal intervention manual was used; the eclectic intervention was based on the patient's diagnosis and current needs. The theoretical orientation of the treatment was mainly psychodynamic; the discussions were of a supportive nature, and the treatment was tailored to deal with issues such as autonomy, identity, and adolescent development. Pharmacological treatment was used when needed.

2.1.3. Participants

2.1.3.1. FCTM. During the period of data collection, the FCTM team was contacted 528 times, and 210 adolescents were met and asked to fill out questionnaires. The remaining contacts were telephone consultations by co-workers. The 91 adolescents who were met more than three times and who were not referred further to psychiatric care were asked to fill in follow-up questionnaires. Of them, those who scored 2 or more on the specific psychosis-risk symptoms and had these symptoms confirmed by interview and hence demonstrated the psychosis-risk criteria of the PROD-screen (Heinimaa et al., 2003) were further interviewed with the Structured Interview for Psychosis-Risk Syndromes (SIPS 3.0; McGlashan, 1998). The number of SIPS-interviewed participants without other concurrent care was 37 at the baseline and 28 at follow-up. The final number of FCTM participants in the present study was therefore 28 adolescents of whom 19 (68%) were female. Of the subjects, 15% received psychotropic medication (1 participant received antipsychotic medication and 3 received antidepressant medication).

2.1.3.2. TAU. All new patients aged 15–18 were presented with the Prodromal Questionnaire (PQ; Loewy et al., 2005), a 92-item self-report measure for screening prodromal symptoms; 836 responses were obtained. A sample of both screen-positive (18 or more positive symptoms) and screen-negative patients was invited to participate, as long as they had not currently or previously been diagnosed with a psychotic or organic brain disorder. Of the 189 adolescents who agreed to participate, 174 completed the whole study protocol, including the SIPS interview (McGlashan, 1998). The recruitment procedure and sample have been described in greater detail previously (Lindgren et al., 2010). Of the 174 participants, 141 were not excluded, due to current or previous psychosis or psychiatric hospital care at baseline, and 59 of these completed the follow-up within 1.5 years, thus representing the standard treatment sample from which matched controls to the

Table 2
Baseline characteristics and outcome distributions of matched groups in adolescents who were treated for early psychiatric symptoms either in a Family- and Community-orientated treatment model or with treatment as usual.

	Family and community intervention (n=28)		Treatment as usual (n=28)		Mann-Whitney U	Two-tailed sig. p	Effect sized
a. Sample characteristics at baseline							
Female	19	(68%)	19	(68%)			
Brief Limited Intermittent Psychotic Syndrome ¹	0	(0%)	0	(0%)			
Attenuated Psychotic Syndrome ¹	11	(39%)	9	(32%)			
General Deterioration Syndrome ¹	1	(4%)	0	(0%)			
Any Prodromal Syndrome	11	(39%)	9	(32%)			
Age	15.5	(1.6)	16.3	(0.8)	269.5	0.044*	-0.65
Days from baseline to follow-up	386	(48)	374	(21)	391.5	0.997	0.33
b. Standardized symptom factor scores at baseline							
GAF-M	55.4	(8.2)	54.3	(8.6)	357.5	0.576	0.13
BAI factor	0.21	(0.71)	0.18	(0.66)	362	0.979	0.04
BDI factor	0.05	(0.71)	0.04	(0.74)	362	0.792	0.01
BHS factor	0.11	(0.88)	-0.09	(0.72)	335	0.624	0.25
SOPS Psychoticism	0.02	(0.93)	-0.17	(0.81)	332	0.332	0.22
SOPS Grandiosity	-0.18	(0.76)	-0.15	(0.68)	381	0.864	-0.04
SOPS Negative	-0.32	(0.90)	-0.06	(0.74)	299	0.130	-0.32
SOPS Disorganization	-0.17	(0.78)	0.06	(0.94)	326	0.284	-0.27
SOPS General	-0.42	(1.08)	-0.08	(0.69)	285	0.081	-0.38
c. Factor score change at follow-up							
GAF-M	11.0	(9.4)	3.4	(13.0)	220	0.004*	0.68
BAI	-0.60	(0.85)	-0.19	(0.74)	255	0.059	-0.52
BDI	-0.84	(1.03)	-0.17	(0.73)	230	0.012*	-0.76
BHS	-0.64	(0.86)	-0.07	(0.77)	222	0.013*	-0.71
SOPS Psychoticism	-0.60	(0.90)	-0.54	(0.65)	388	0.955	-0.08
SOPS Grandiosity	-0.13	(0.73)	-0.27	(0.54)	337	0.372	0.22
SOPS Negative	-0.38	(0.70)	-0.29	(0.89)	332	0.332	-0.11
SOPS Disorganization	-0.19	(0.72)	-0.32	(0.69)	333	0.338	0.19
SOPS General	-0.62	(0.92)	-0.58	(0.89)	370	0.727	-0.05

* Significant at the 0.05 level.

¹ Criteria of Ultra High Risk for Psychosis.

FCTM were drawn. Of the 28 TAU adolescents included 10 received psychotropic medication. Antidepressants were prescribed to 8, atypical antipsychotics to 2, a mood stabilizer to 2, stimulants to 1, and anxiolytics to 1 adolescent. Hence, one patient could have several types of medication.

The regional ethics committee of the Hospital District approved both data collections, which were carried out in accordance with the Declaration of Helsinki. All subjects gave their informed consent prior to their inclusion, voluntary participation in the study was emphasized, and all details that might disclose the identity of the subjects were removed from the data sets before analysis.

2.2. Instruments

The Beck Anxiety Inventory BAI; Beck and Steer (1993) was used to assess anxiety, and the Beck Depression Inventory II (BDI-II) depression symptoms (Beck et al., 1996, 2005; Steer et al., 1999). Both scales consist of 21 items with four-point scales (0–3 points, 3 being the greatest in severity). The Beck Hopelessness Scale (BHS; Beck and Steer, 1988) was used to assess hopelessness. The BHS was originally designed to assess hopelessness in suicidal patients, but it is also sensitive to depression (Beck et al., 1974). The BHS consists of 20 true–false items scored with 0 or 1. The Finnish versions of the Beck questionnaires were used in the present study.

The Structured Interview for Psychosis-Risk Syndromes, version 3.0 (SIPS, previously known as the Structured Interview for Prodromal Syndromes; McGlashan, 1998) with its incorporated 19-item Scale of Psychosis-risk Symptoms (SOPS) was used to assess psychosis-risk symptoms (range 0–6 in each item). The SIPS includes a modified scale (Hall, 1995) of Global Assessment of Functioning

(GAF-M), which was used to measure general functioning ability (1–100 points, 100 being superior functioning). The GAF-M has a satisfactory reliability with an interclass correlation coefficient of .81 in a sample of regular psychiatric staff (Hall, 1995).

All raters in both studies were trained and certified to use the SIPS interview by Dr. Walsh from PRIME-clinic, Yale University.

2.3. Statistical methods

To reduce the number of comparisons, achieve greater measurement precision, and take the ordinal nature of scales into account, latent factor models appropriate for ordinal data were estimated for the SIPS/SOPS, BAI, BDI-II, and BHS with Mplus version 7.11 (Muthén and Muthén, 2013). We used the full-baseline datasets from both studies ($n=221, 362, 379, \text{ and } 383$, respectively), both for model construction and factor score standardization.

For the 19 SIPS/SOPS measures representing psychosis-risk symptom dimensions, five continuous latent factors were estimated from the polychoric correlation matrix with the WLSMV algorithm and rotated with the Oblimin method; details of this analysis are available from the authors on request. The factors were labelled Psychoticism, Grandiosity, Negative, Disorganization, and General Symptoms. For the three Beck scales, latent single-factor models were estimated with the same algorithm. Maximum *a posteriori* (MAP) factor scores were calculated for use in all further analyses. Follow-up latent factor scores were estimated with the same baseline model structure in the interest of model invariance. All change scores were obtained by subtracting follow-up factor scores from baseline factor scores.

For each of the 28 FCTM participants, a matching same-gender

pair was selected algorithmically from the 59 adolescents in the TAU sample. The matching algorithm balanced age, difference in baseline GAF-M, and follow-up time within the pair, with a wide range of relative weights used to test these three variables. Constraints on intra-pair and group differences in demographic and baseline clinical variables in the resulting solutions were tightened until a single solution remained. A more detailed description of the matching is given in [Appendix 1](#). Descriptive baseline statistics are presented in [Table 2a](#) by group. The matched groups were compared with two-tailed Mann–Whitney *U* tests on baseline differences, as well as on follow-up change in general functioning, anxiety, depression, hopelessness, and the five psychosis-risk symptom factors. *P* values under 0.05 were considered significant.

3. Results

The groups did not differ on clinical measures at baseline, as shown in [Table 2b](#), but the FCTM group was, on average, 0.8 years younger. Combined-sample sum scores of the BAI ($M=13.9$, $SD=7.8$), BDI-II ($M=17.9$, $SD=10.3$), and BHS ($M=8.2$, $SD=5.3$) measures, as well as individual maximum values SOPS positive symptoms at baseline ($M=2.7$, $SD=1.5$; range 0–5) indicated moderate symptom severities. Change scores for the outcome variables are presented in [Table 2c](#). FCTM was more effective than TAU in improving functioning (20% vs. 6% improvement in scores) as well as self-reported depression and hopelessness (53% vs. 14% and 41% vs. 3% improvement in scores, respectively), with Cohen's *d* effect sizes approximately 0.7. Differences in change between groups in psychosis-risk symptoms and anxiety symptoms did not attain statistical significance. When analyses were limited to individuals with at least one definite positive or disorganization symptom (score of 2 on any SOPS P or D scale), thus excluding two FCTM and 4 TAU individuals, the change results were slightly attenuated but stayed statistically significant.

4. Discussion

In the present study among subjects who had psychosis-risk symptoms, we found greater improvement in functioning and level of self-reported depression and hopelessness in adolescents who received need-adapted, Family- and Community-orientated integrative treatment instead of standard adolescent psychiatric treatment. Results were attained in a matched-pair study design with patients treated in two different treatment systems. In addition to the differences being statistically significant, standardized effect sizes for differences were of medium size at 0.7. The mean GAF-M functioning improvement in the FCTM group was 8 points higher, suggesting a clinically significant advantage ([Kessler et al., 2003](#)) compared to TAU, as mean GAF-M rose over 60 points in the FCTM. Another important finding was that the reduction in hopelessness was significantly greater in FCTM, as hopelessness measurement has been designed to assess suicidality ([Beck et al., 1974](#)).

The present results support our hypothesis that an FCTM-based early intervention service is more effective than TAU in adolescents who are entering the health-care system due to early psychiatric symptoms. Furthermore, even a mixed group of patients with psychosis risk syndrome and earlier, lower level positive psychosis-risk symptoms, and some patients with none, can improve in depression, hopelessness, and functioning. Hence, on the psychosis continuum FCTM seems to reduce co-morbid symptoms of psychosis risk in adolescents more effectively. To our

knowledge, this is the first time this difference in effectiveness has been reported with these types of treatment models.

Even though there was a significantly greater improvement in functioning and in level of depression symptoms and hopelessness in the FCTM group, the groups did not differ in rater-assessed psychosis-risk symptom improvement or in self-reported anxiety. Anxiety symptoms were, however, mostly mild already at the baseline, which left little room for significant difference in improvement between treatment models, even though there was a clear tendency for that to take place ($p=0.059$). All SOPS scales showed a declining tendency in both groups. Positive psychosis-risk symptoms had a declining tendency during treatment, but as this was also found in both groups, there was no difference between them. As the baseline level was already low, there was little room for additional improvement.

Previous evidence suggests changes in functioning among adolescents who are seeking help for psychiatric symptoms and who are treated in an early intervention service. In a study by [McGorry et al. \(2002\)](#), help-seeking subjects at clinical risk for psychosis reported an improvement in functioning ability in both a special treatment group (antipsychotic medication and cognitive-behavioural therapy) and in a treatment-as-usual group. However, all those participants received strong support for functional recovery, as they were treated by a specialized early intervention team with a broad range of psychosocial interventions supporting functional recovery. Moreover, a more recent study reported no differences in functioning level between special treatment (cognitive therapy) and monitoring (treatment as usual) groups of subjects at risk for psychosis, but showed a larger improvement in psychotic symptoms in the specific treatment group ([Morrison et al., 2012](#)). Furthermore, another recent study has found benefits in treating adolescents at risk for psychosis with family therapy, as evinced by a greater reduction of psychosis-risk symptoms ([Miklowitz et al., 2014](#)). These findings may suggest that improvement in functioning is a result of special intervention models that focus on functional recovery and that symptom reduction in psychosis-risk symptoms is more effective for those who receive antipsychotic medication, cognitive behavioural therapy, or manualized family therapy. The present FCTM did not include special techniques from manualized family therapy or cognitive behavioural therapy focusing on psychosis-risk symptoms. Hence, the lack of these therapy techniques might explain why there was no difference in improvement in psychosis-risk symptoms between the groups. However, the FCTM programme integrated intervention techniques from the Open Dialogue model for first-episode psychosis by [Seikkula \(Seikkula and Olson, 2003\)](#), as well as the model of need-adapted treatment for first-episode psychosis of [Alanen \(Alanen et al., 1991\)](#). Some common elements from cognitive behavioural therapy, namely, psycho-education and normalization, were integrated into the FCTM. Thus, the FCTM included several treatment models for first-episode psychosis, all of which are designed to reduce symptoms on the psychosis continuum and reduce stress in social relationships.

There are several advantages to the FCTM approach of meeting adolescents at an early stage when difficulties in functioning and other symptoms have recently arisen, but not yet reached a chronic state with co-morbid symptoms or behaviour. Recognition of the problems has been found to be the first and most important step in the help-seeking process, followed by a decision to seek and engage in help ([Cauce et al., 2002](#); [Saunders and Bowersox, 2007](#)). Adolescents themselves might not think their difficulties require treatment, so it may be unlikely that they will seek help for their symptoms ([Wilson and Deane, 2010](#); [Joa et al., 2015](#); [Lower et al., 2015](#)). In the FCTM intervention, the first contact was made by a community professional in an adolescent's life, for example, a school nurse or counsellor who

had been informed by a teacher of an adolescent's changed behaviour or difficulties with schoolwork. Even when an adolescent did not seek help at first, the environment reacted. In FCTM, help is available with low-latency, even if the symptoms do not meet the criteria for access to standard adolescent psychiatric care.

In other interventions, community orientation has mostly included education in the early signs that should prompt referral for care (McFarlane et al., 2010; Lower et al., 2015). In the FCTM community orientation, community co-workers were members of the FCTM team. This made it possible for adults in the adolescents' everyday lives to be aware of what was going on in the care service; the adults could also be present in the care sessions, and the adolescents had a chance to turn to them between sessions whenever necessary. This might have helped the adults support the adolescents in their daily functioning at school. On the other hand, FCTM clinicians were invited to participate in the adolescents' living environment whenever problems in functioning were observed. Thus, problems could be addressed right away with the help of professionals who could ameliorate the stress factors.

Despite clear differences between treatment models in change in functioning and self-reported depression and hopelessness, our study has several limitations. First, the treatment paths for the two groups were different: the FCTM group received low-latency attention, which makes it possible that their problems were of a less chronic nature. The low-latency FCTM might thus explain why these variables had greater improvement in FCTM compared to TAU. However, the follow-up time was long in both groups, and the baseline symptoms were equally severe in both, as the mean GAF was below 60, which has been a threshold for severe mental illness in the normal population (Kessler et al., 2003), supporting the idea that FCTM could be more effective in treating early psychiatric symptoms. Moreover, in the present study girls were somewhat over-represented (68%). This is unusual in psychosis-risk populations, where males tend to be over-represented, but typical of the gender distributions in the participating TAU units. It is possible that the PROD-screen is more sensitive to girls' symptoms; in a previous study, where subjects were screened with the PROD-screen before a SIPS interview, a

similar gender balance with 67% females was found (Salokangas et al., 2007).

Second, as a limitation of the generalization of results, the samples were not matched by medication, as 15% of the FCTM group and 36% of the TAU group received psychotropic medication. Third, even though comparison was based on matched pairs, the study included all available FCTM subjects and selected matched pairs from a larger group of TAU subjects. It is possible that there were other unmeasurable effects than treatment factors which might have an effect to the results and favour FCTM. The FCTM subjects might represent a selected population, who for example had better motivation to care, as only those who completed the treatment were included. However, drop out percentage was 27%, which is acceptable. Moreover, as time periods for data collection were different for FCTM and TAU, it leaves open a possibility that changes in symptoms were due to larger societal dynamics. Hence, because of the lack of a randomized study design, the present results should be interpreted with caution.

In sum, in this study we found greater improvement in functioning, depression, and hopelessness in adolescents who received need-adaptive, Family- and Community-orientated integrative treatment rather than standard adolescent psychiatric treatment. Our findings highlight the importance of grounding and networking in the psychiatric care of adolescents.

Disclosure of interests

The authors have no competing interests.

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Appendix 1. Matching procedure

For each of the 28 special intervention (FCTM) participants, a matching same-gender pair was selected algorithmically from the 59 adolescents in the standard treatment (TAU) sample.

The algorithm worked as follows.

1. Generation of matching sets

- a. For each individual in the FCTM sample, a same-gender TAU match was selected by choosing among remaining individuals the one with the lowest value for the function

$$\text{abs}(\text{GAF_difference}) + \text{abs}(\text{age_difference} * \text{age_difference_weight}) + (\text{delay_ratio} * \text{delay_ratio_weight})$$
 where abs stands for absolute value, age is expressed in years, and delay_ratio is the ratio in follow-up delay time (or it's inverse, whichever is greater).
- b. Matches were made in order of increasing age in the FCTM sample, as the youngest participants had the fewest potential matches because of the sample age difference.

2. The process was repeated for all combinations of values from $10^{-2.7}$ to $10^{2.7}$ (with the exponent varying in steps of 0.05) for both age_difference_weight and delay_ratio_weight, yielding $109^2 = 11881$ matching sets, 568 of which were unique.

3. Limits for intra-pair and between-group differences in the matching variables were manually lowered until a single solution remained when the limits and final values were as follows:

	Intra-pair difference		Between-group difference	
	Limit	Final value	Limit	Final value
GAF-M	20	19	1.5	1.2
Age	2.9	2.8	0.89	0.77
Delay ratio	1.35	1.31	1.04	1.03

Note that this matching process was blind to treatment outcome.

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