Soc Psychiatry Psychiatr Epidemiol (2012) 47:1607–1615
DOI 10.1007/s00127-011-0467-4

ORIGINAL PAPER

Evaluation of a multi-element treatment center for early psychosis in the United States

Sarah R. Uzenoff · David L. Penn · Karen A. Graham · Sylvia Saade · Barbara B. Smith · Diana O. Perkins

Received: 4 May 2011 / Accepted: 29 December 2011 / Published online: 26 January 2012

Abstract
Purpose A growing body of research has demonstrated the potential for comprehensive, phase-specific care to improve clinical and functional outcomes in early psychosis. However, there have been no evaluations of such treatment models in the United States (US). This study is a naturalistic, prospective 1-year follow-up of an early psychosis cohort treated in one of the first US-based multi-element treatment centers.
Methods Participants were 163 individuals treated at the Outreach and Support Intervention Services (OASIS) clinic, a multi-element treatment center for early psychosis. Data were collected as part of routine care at 6-month intervals. Primary outcomes included role functioning and involvement in work or school.
Results Over the course of 1 year of treatment, individuals experienced significant improvements in positive and negative symptoms, role functioning, and global functioning. The proportion of individuals meeting symptom remission and functional remission criteria increased significantly from baseline to 1 year, as did the proportion of individuals attending school. There were also trend-level reductions in substance abuse.
Conclusions This study provides preliminary support for the efficacy of comprehensive early intervention services in the US.

Keywords Psychotic disorders · Treatment · Outpatient clinic · Community

S. R. Uzenoff · D. L. Penn
Department of Psychology, University of North Carolina, Chapel Hill, NC, USA
e-mail: suzenoff@unc.edu

D. L. Penn · K. A. Graham · S. Saade · B. B. Smith · D. O. Perkins
Outreach and Support Intervention Services Program, University of North Carolina, Chapel Hill, NC, USA

D. L. Penn · K. A. Graham · B. B. Smith · D. O. Perkins (✉)
Department of Psychiatry, University of North Carolina at Chapel Hill, CB #7160, Chapel Hill, NC 27599-7160, USA
e-mail: dperkin@med.unc.edu

Introduction

Early intervention in psychosis continues to emerge as a treatment modality defined by unique models and techniques [1, 2]. Chief among these is the multi-element treatment model, wherein multiple services for early psychosis are provided under a single treatment umbrella. The multi-element treatment model has been evaluated primarily through uncontrolled, parallel controlled, or historical controlled studies (see [3–5] for representative publications), as well as in one randomized controlled trial as compared to standard care (e.g. [6]). Overall, multi-element treatment has been associated with benefits in a range of domains including symptom reduction, quality of life and social functioning, and adherence and retention in treatment [7, 8]. However, multi-element treatment thus far has flourished predominantly in a handful of Western European nations as well as in Australia, Canada, and the UK, and publications reporting on multi-element treatment for early psychosis originating in the United States (US) have been limited [9]. Lagging research progress in this area may be explained in part by differences in mental health care policy and service provision between the US and countries with well-established early psychosis initiatives. Accordingly, there is a great need to evaluate the

multi-element treatment model's feasibility within this context.

Study aims

The present study is a naturalistic prospective follow-up of individuals with early psychosis consecutively treated at the Outreach and Support Intervention Services (OASIS) clinic affiliated with the University of North Carolina (UNC) Hospitals in Chapel Hill, NC, USA. The primary study aims were as follows: (1) to characterize the population accepted for treatment at OASIS during its first 3 years of operation (June 2005–June 2008); and (2) to examine whether the treatment offered at OASIS is associated with improvement on core indices of recovery.

Methods

Participants

OASIS serves individuals aged 16–36 who have been treated for psychosis (i.e., who have been taking antipsychotic medications) for no more than 3 years, as well as previously unmedicated individuals who have been ill for up to 5 years. Referrals to OASIS come from inpatient and emergency treatment services, college counseling centers, family members, and community mental health providers. The first point of contact with OASIS involves a phone screening, conducted by the clinic director or a clinical social worker. At this point a brief history is obtained. Exclusionary criteria for acceptance into the program include head trauma, mental retardation, and pervasive developmental disorders. Individuals accepted for treatment are then scheduled for an intake appointment. For the purposes of this study, all individuals accepted for treatment for early psychosis (i.e., meeting diagnostic criteria for schizophrenia, schizophreniform disorder, schizoaffective disorder, bipolar disorder, major depressive disorder with psychotic features, brief psychosis/brief psychotic episode, and psychosis not otherwise specified) were included in analyses. Individuals determined to be experiencing prodromal symptoms at the time of intake were excluded from all analyses.

Setting

OASIS is a comprehensive, multi-element center for the treatment of early psychosis providing outpatient services to approximately 100 patients. The clinic is located away from the primary hospital complex in an easily accessible office suite. The clinical staff at OASIS includes licensed clinical social workers, psychiatrists, and psychologists. Every patient is assigned a primary clinician (a social worker) who provides clinical services (including case management and supportive or cognitive-behavioral therapy) based on individual need. All patients are assessed for eligibility to receive community support, which broadly encompasses assistance in living skills with an objective of helping recipients achieve autonomy and stability. Services are frequently provided in the community or at the patient's home in addition to those offered in the office. In addition, OASIS clinicians work closely with various agencies in the community, such as vocational rehabilitation sites and schools or colleges, to facilitate patients' functional recovery. Core services include a psychosocial assessment by an OASIS clinician, a family interview with a family therapist, and psychiatric assessment and medication management from a psychiatrist. Additional services include individual therapy, group therapy, single family sessions, multifamily group therapy, and substance abuse assessment and counseling.

Procedures

As part of a clinical quality assurance program, clinical data were gathered during the intake appointment and at 6-month intervals by OASIS clinicians. Data were maintained in both paper charts as well as an electronic database. UNC's Institutional Review Board approved use of the quality assurance data for this report and thus waived informed consent requirements.

Measures

Demographic information collected includes age, sex, race, marital status, and living situation. This information was verified and/or updated at each subsequent visit. Number of days hospitalized over the preceding 6-month period was assessed at each evaluation time point following baseline.

The Brief Psychiatric Rating Scale (BPRS-E) [10] was used to assess symptoms. A four-factor solution including positive symptoms, activation, negative symptoms, and depression/anxiety [11] was used due to previous demonstrations of its validity for a recent-onset psychosis population as well as across the illness course [12]. Symptom remission was defined according to criteria proposed by Andreasen et al. [13]. To be considered 'remitted,' individuals must have ratings of mild or less ($\leq$3) simultaneously on all of the following items: grandiosity, suspiciousness, unusual thought content, hallucinatory behavior, conceptual disorganization, mannerisms/posturing, and blunted affect. In addition, symptom levels must stay below the severity threshold for 6 months to meet the full remission criteria. Therefore, to meet full remission criteria at 6 months, individuals must have met severity criteria at both the baseline and 6-month visits. Participants

were classified as either "in symptomatic remission" or "not in symptomatic remission" at 6 months and at 1 year.

Alcohol and illicit drug use was assessed with the Alcohol Use Scale (AUS) and Drug Use Scale (DUS) [14]. Presence of substance abuse at each evaluation point was defined by any AUS/DUS items rated ≥3. Absence of AUS/DUS items rated ≥3 was classified as 'substance abuse absent.'

Medication adherence was assessed via a single-item rating made by the psychiatrist at each visit. The clinician was asked to rate the frequency with which the patient takes his/her medication using the following prompt: "How many days have you missed your medication in the past month?" The number of days of missed medication was then coded according to the following scale: 1 = *always/almost always adherent* (76–100% of the time), 2 = *usually adherent* (51–76% of the time), 3 = *sometimes adherent* (26–50% of the time), 4 = *never/almost never adherent* (0 = 25% of the time). At each time point, individuals with ratings of 1 were classified as 'adherent', and those with ratings of 2 through 4 were classified as 'nonadherent.'

The Global Assessment of Functioning (GAF) scale [15] was used to measure global functioning, and the Role Functioning Scale (RFS) [16] was used to measure social and occupational functioning. The RFS comprises four single rating scales (working productivity, independent living and self care, immediate social network relationships, and extended social network relationships), each of which are rated on a scale from 1 (minimal level of role functioning) to 7 (optimal level of role functioning). The total score represents a Global Role Functioning Index with scores ranging from 4 to 28.

School or employment status was documented at each evaluation time point. Individuals were considered to be working or attending school at least half-time if employment status was 21–40+ h/week or if the individual was involved in school activities for at least 20 h/week.

Functional remission was defined by adequate to optimal role functioning (i.e., scores ≥6 on each of the four RFS subscales) as well as working or attending school at least half-time. Participants were classified into two categories: 'in functional remission' and 'not in functional remission' at each visit.

Data analytic plan

Within-subject change from baseline to 1 year on symptom, social and vocational outcomes were examined using paired-sample *t* tests. Effect sizes for paired data were calculated as per the suggestion of Cohen [17] and evaluated according to accepted standards. Logistic regression analyses were used to test changes in proportions of individuals meeting criteria for symptomatic remission, functional remission, and other binary functional outcomes of interest. All of the aforementioned analyses were conducted using PASW Statistics [18].

Results

Between the dates of 1 June 2005 and 1 June 2008, 405 individuals were phone-screened by OASIS clinicians. Of these 405 individuals, 150 were referred out for meeting exclusion criteria (see "Methods") and 255 individuals were accepted for treatment (see Fig. 1 for treatment flow diagram). Of the 255 individuals accepted for treatment at OASIS, 31 individuals did not attend an intake appointment (i.e., did not follow-up to schedule an appointment or no-showed a scheduled appointment). An additional 24 individuals had psychosocial intakes but never received a baseline assessment (10 of these individuals were consults and therefore did not receive baseline assessments, and an additional 14 individuals were lost to follow-up). Of the 200 individuals who received baseline assessments, 2% ($n = 4$) were consults (i.e., did not receive ongoing care at OASIS) and 17% ($n = 33$) were accepted for monitoring at OASIS due to their clinical at-risk (i.e., prodromal) status. The remaining 163 individuals comprise the early psychosis cohort that was analyzed in this study.

Thirty-nine percent ($n = 64$) of the study cohort was discharged prior to 1 year, with one-third of all discharged individuals refusing treatment at the time of discharge. Discharge reasons for individuals not refusing treatment ($n = 43$) included; geographic relocation ($n = 18$), no longer appropriate for care at OASIS (i.e., too chronic or in need of more intensive services) ($n = 10$), return to work or school full-time ($n = 6$), preference for another provider ($n = 6$), program dissatisfaction ($n = 1$), probation violation/incarceration ($n = 1$), and death ($n = 1$).

Because data collection occurred as part of routine care and was completed by full-time clinicians, missing data were expected to occur due to both clinician factors (including failure to administer all assessments at each time point) as well as client factors (including refusal to complete self-report measures, failure to attend appointments on or near the 6-month or 1-year study visits, and attrition). The database was constructed such that all required assessment forms are generated simultaneously at the time a visit is manually established by a clinician. As a result, a visit only appears in the database if one of more of the outcome measures is completed at that time point, and any other required forms that are not completed will appear in the database as blank. At 6 months, visits were missing for 16 patients (i.e., 12% of 132 expected visits), and at 1-year visits were missing for 14 patients (i.e., 14% of 101

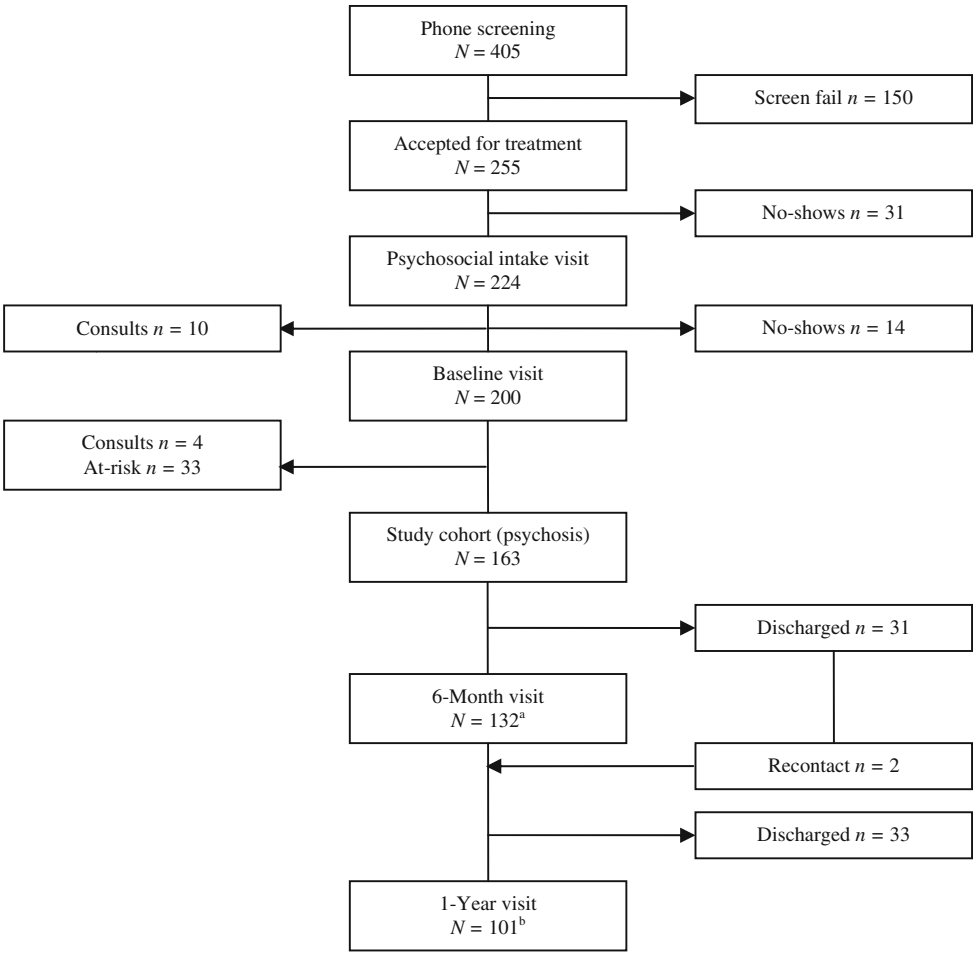

Fig. 1 OASIS treatment flow for the period 1 June 2005–1 June 2009. [a]Data available for $n = 116$; [b]data available for $n = 87$

expected visits). Additional missing data were observed within existing study visits, resulting in different numbers of individuals for whom paired (within-subject) comparisons could be made for each of the outcome measures.

Characterization of the OASIS sample

Sixty-seven percent of the study cohort was male, and 66% was Caucasian (see Table 1). Mean age at the time of intake to the clinic was 23.1 years (SD = 4.5), with a higher mean age for females than males [$F(1,161) = 3.24$, ns]. Most individuals (91%) had never been married and were living in private residences (91%). The most common diagnosis was schizophrenia, followed by psychosis NOS (see Fig. 2). Of the 122 individuals for whom AUS/DUS data were collected at baseline, 23% ($n = 28$) were abusing one or more substances at baseline, with cannabis and alcohol representing the most frequently abused substances. Medication data were recorded for 72% ($n = 117$) of the sample at baseline.[1] Of individuals prescribed

[1] In cases where individuals were prescribed more than one antipsychotic medication, the lower adherence rating was used.

Table 1 Demographics for OASIS study cohort

	Male	Female	Total
Subjects, *n*	110	53	163
Age, *M* (SD)	22.7 (4.2)	24.0 (5.1)	23.1 (4.5)
Race, *n*			
White/Caucasian	81	26	107
African American/Black	23	21	44
Asian	5	3	8
Hispanic/Latino	0	3	3
Native American	1	0	1
Marital status, *n*			
Never been married	104	45	149
Married	4	4	8
Divorced	2	2	4
Separated	0	2	2
Living situation, *n*			
Private residence	100	49	149
Group home	9	2	11
Transitional housing	0	2	2
Support apartments	1	0	1

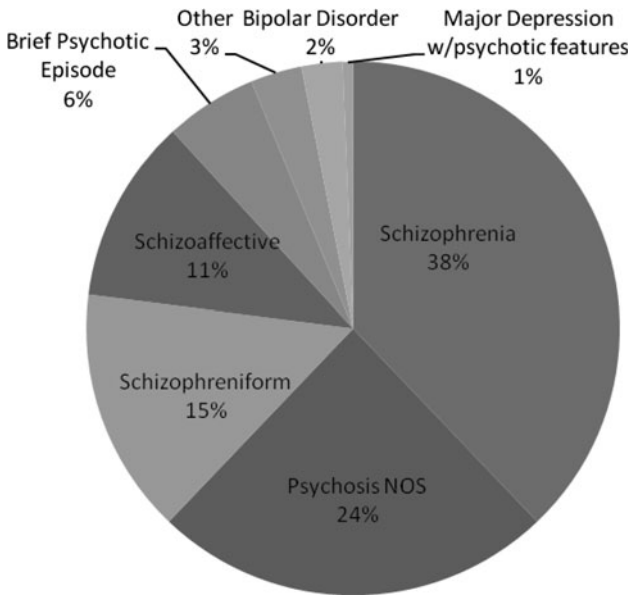

Fig. 2 Primary diagnoses at baseline. Data available for $n = 161$

antipsychotic medications, 91% were rated as adherent to their medication regiments. Information on duration of untreated psychosis (DUP) was only available for 76 individuals in the study cohort. Due to concerns regarding to the validity of DUP calculations, DUP was not used in successive analyses.

Data on previous treatment and involvement with the correctional system was available for $n = 109$. Of these individuals, 71% ($n = 77$) had been in outpatient treatment for a psychiatric disorder prior to engaging with OASIS, however, only 15% ($n = 16$) were receiving concurrent services outside of OASIS at the time of intake. Individuals had a mean of 1.4 previous hospitalizations (SD = 1.29, Mdn = 1, mode = 1, range = 0–6). There were no significant differences in baseline symptom (BPRS total scores) or levels of global functioning (GAF) between individuals who had data on previous treatment and those who did not.

One-year outcomes

Complete hospitalization data for the entire study period was available for 70 individuals, 27% ($n = 19$) of whom had been hospitalized for a mean of 13.84 nights (SD = 11.02, Mdn = 11, range = 4–45) over the course of their first year of treatment. Overall, individuals were hospitalized for a mean of 3.76 nights (SD = 8.37, Mdn = 0, range = 0–45). Individuals with complete hospitalization data did not differ significantly from those with incomplete data on baseline demographic or clinical variables (including age, sex, DUP, symptom remission status, functional remission status, GAF, or private vs. not private insurance status). For individuals with paired baseline and 1-year data ($n = 67$), substance abuse prevalence fell from 24% at baseline to 12% at 1 year, though there was no statistically significant change in likelihood of substance abuse from baseline to 1 year [OR = 0.48, 95% CI (0.22, 1.05), $p = .067$].

For those with paired baseline and 1-year medication adherence data ($n = 49$), medication adherence fell from 90% at baseline to 86% at 1 year. There was no significant change in the proportion of adherent individuals from baseline to 1 year.

Changes in primary outcomes over 1 year

One-year visits were established in the OASIS outcome database for 87 individuals. Individuals who were missing 1-year visits for any reason (including discharge, lost to follow-up, uncompleted forms, etc.) did not differ significantly from individuals with 1-year visits in age, sex, or on any baseline outcome measures. Baseline means for the entire sample, paired means for individuals with both baseline and 1-year data, and corresponding significance tests and effect sizes are presented in Table 2.

Symptoms and global functioning

Significant symptom reduction from baseline to 1 year was observed on the BPRS total score as well as on the positive symptoms, activation, and negative symptoms factors, with changes corresponding to small to medium effect sizes. There was no statistically significant change on the depression/anxiety factor. There was also a statistically significant improvement in GAF scores from baseline to 1 year, corresponding to a large effect size and a shift from serious symptoms or level of impairment to mild symptoms or level of impairment [15].

Role and occupational functioning

Scores on each of the four RFS items showed significant improvement from baseline to 1 year, corresponding to medium to large effect sizes. Change on the total score was also statistically significant and corresponded to a large effect size. Individuals were significantly more likely to have adequate to optimal role functioning across domains on the RFS (i.e., scores $\geq$6 on each item) at 1 year than at baseline [OR = 3.46, 95% CI (1.64, 7.26), $p = .001$]. Individuals were significantly more likely to be involved in school at 1 year than at baseline [OR = 2.40, 95% CI (1.33, 4.33), $p = .004$] (see Table 3). Likewise, there was an increased likelihood of at least half-time occupational functioning between baseline and 1 year, but this change

Table 2 Symptom and functional outcomes at baseline and over course of 1 year

	Total sample			Paired sample							
	Baseline			Baseline			1 year				
	n	*M*	(SD)	*n*	*M*	(SD)	*M*	(SD)	*t*	*p*	*d*
BPRS (total)	121	39.57	(10.86)	66	38.77	(10.65)	33.12	(8.50)	3.82	<.001**	0.47
Positive		7.35	(4.00)		6.92	(3.60)	5.64	(2.94)	2.50	.015*	0.31
Activation		5.48	(2.03)		5.35	(1.88)	4.64	(1.08)	2.95	.004**	0.36
Negative		5.11	(2.56)		5.41	(2.72)	4.52	(2.21)	2.55	.013*	0.31
Dep/anx		7.36	(3.33)		7.08	(3.24)	6.32	(2.64)	1.71	.092	0.21
GAF	162	50.51	(11.42)	84	49.98	(10.62)	65.52	(15.23)	−9.56	<.001**	−1.04
RFS (total)	121	17.14	(5.28)	55	16.75	(5.19)	20.36	(5.25)	−6.08	<.001**	−0.82
Working productivity		3.48	(1.92)		3.29	(1.94)	4.62	(1.99)	−5.83	<.001**	−0.79
Independent living		4.44	(1.58)		4.42	(1.65)	5.24	(1.50)	−3.82	<.001**	−0.52
Immediate soc. network		4.74	(1.37)		4.78	(1.26)	5.53	(1.12)	−4.77	<.001**	−0.64
Extended soc. network		4.48	(1.36)		4.25	(1.31)	4.98	(1.35)	−4.30	<.001**	−0.58

BPRS Brief Psychiatric Rating Scale (total score range 24–168; positive subscale range 4–28; Activation subscale range 4–28; Negative subscale range 3–21; Depression subscale range 4–28), *GAF* Global Assessment of Functioning (range 1–100), *RFS* Role Functioning Scale (total range 4–28; subscale ranges 1–7)

* $p < .05$, ** $p < .01$

Table 3 Occupational status for subsample with paired data at baseline and 1 year ($n = 86$)

Employment status	Baseline				1 year			
	School involvement				School involvement			
	None (%)	<Half-time (%)	≥Half-time (%)	Total (%)	None (%)	<Half-time (%)	≥Half-time (%)	Total (%)
Unemployed	48.8	10.5	4.7	64	31.4	20.9	5.8	58.1
Working <half-time	7.0	4.7	0	11.6	4.7	7.0	0	11.6
Working ≥half-time	23.3	1.2	0	24.4	27.9	2.3	0	30.2
Total (%)	79.1	16.3	4.7	100	64	30.2	5.8	100

was not statistically significant [OR = 1.52, 95% CI (0.87, 2.67), $p = .14$].

Symptom and functional remission

There was a significant increase in the proportion of individuals meeting symptom remission criteria as determined by severity only from baseline to 1 year [OR = 3.02, 95% CI (1.67, 5.47), $p < .001$] (see Table 4). Eighty-four percent of individuals with symptom data at all three time points ($n = 48/57$) met remission severity criteria at one or more study visits over the course of the year, and 63% ($n = 36$) experienced symptom remission for a duration of at least 6 months at some point during the study period. Fifty-seven percent of individuals with symptom data at 6 months and 1 year ($n = 38/67$) met both severity and time criteria for symptom remission at 1 year.

There was also a statistically significant increase in proportion of individuals meeting functional remission criteria from baseline to 1 year [OR = 3.63, 95% CI (1.16,

Table 4 Symptom and functional remission status for subsample with paired data at baseline and 1-year

	Baseline *n* (%)	1 year *n* (%)
All available paired data		
Symptom remission (severity criterion only) ($n = 66$)	27 (41)	45 (68)
Functional remission ($n = 55$)	2 (4)	7 (13)
Only cases with both symptom and functional remission data ($n = 43$)		
Symptom remission (severity criterion only)	15 (35)	27 (63)
Functional remission	1 (2)	4 (9)
Of those in symptom remission, % in functional remission	1 (7)	3 (11)
Of those in functional remission, % in symptom remission	1 (100)	3 (75)
% meeting both symptom and functional remission criteria	1 (2)	3 (7)

All data in this table consider symptom remission as defined only by the severity (i.e., mild or less) criterion

9.71), $p = .025$]. Eighteen percent of individuals with functional remission data at all three time points ($n = 9/51$) met functional remission criteria at one or more study visits over the course of the year, though only 8% ($n = 4$) were able to sustain this level of functioning for two consecutive study visits (6 months and 1 year, in all cases).

Discussion

The present study is the first systematic evaluation of a US-based multi-element treatment center for early psychosis. The aims of this naturalistic prospective study were to characterize the population presenting for treatment during the clinic's first 3 years of operation and to examine the course of the first year of treatment. Discussion of the findings with respect to these two aims is presented below.

The individuals accepted for treatment for early psychosis at OASIS share characteristics with samples reported by other specialized early psychosis treatment programs with respect to sex, age, marital status, and ethnic composition [4, 19]. The findings attest to the fact that this is a high-risk population, as approximately one quarter met criteria for either substance abuse or substance dependence. Overall, it is clear that there is a need for mental health services for this population in the state of NC and that a model of community-based multi-element treatment for early psychosis is feasible.

Baseline global functioning scores at OASIS were notably higher than those in published reports from other multi-element treatment programs [20, 21]. This likely reflects differences in treatment models and referral sources. Because OASIS does not offer its own inpatient services, many patients are referred after their acute symptoms have resolved, in contrast to multi-element clinics providing inpatient services, where the first point of contact with the service may be a hospitalization. It is also important to note that the population served at OASIS is best characterized as an "early psychosis" cohort representative of individuals within the broader critical period of early intervention, rather than a strictly "first-episode" or "first presentation to treatment" sample.

OASIS was able to successfully engage a high proportion of individuals entering treatment. Only 13% of the cohort was discharged for reasons of refusing treatment over the course of the first year. An extremely conservative rate of disengagement (33%) can be calculated by including individuals who had geographic relocations, returned to work or school, left for reasons of program dissatisfaction, or missed two consecutive study visits, in addition to those who were discharged for reasons of refusing treatment. Nonetheless, these statistics reinforce the potential for multi-element early intervention services to engage young adults much more successfully than standard care [22] or interventions limited to medication management alone (i.e., in drug trials for first-episode psychosis) [23, 24], where less than half of patients continue in treatment for at least 1 year.

Over the first year of treatment, individuals in treatment at OASIS experienced significant improvements in global functioning and significant decreases in positive and negative symptom levels. There was also a significant increase in the proportion of individuals meeting symptom remission criteria, as determined by severity only, from baseline to 1 year, with rates of remission at 1 year approaching those reported at other multi-element treatment centers using these same criteria (i.e., 69–78%) [19, 25, 26]. Furthermore, OASIS had a favorable percentage of individuals who met remission severity criteria at one or more study visits over the course of the year in comparison to the only other study that has reported on this same statistic in a multi-element treatment model for early psychosis (i.e., [27]) (84 vs. 77%). The percentage meeting severity remission criteria at any point during the first year of treatment at OASIS also surpasses the rate of symptom remission reported in a large randomized, double-blinded trial of antipsychotic medication effectiveness using the same standardized remission criteria as our study (84 vs. 70%) [24]. Likewise, the rate of hospitalizations at OASIS was low as compared to that reported in an epidemiological study of standard care for individuals recently experiencing an initial hospitalization for psychotic disorders in the US (i.e. 36.5%) [28], though hospitalization rates reported by other early psychosis treatment programs vary more widely (5–59%) [19, 29, 30]. Overall, these findings suggest that treatment at OASIS may be associated with meaningful symptom reduction, and highlight the potential for multi-element treatment to improve outcomes observed in standard care or via pharmacotherapy alone.

Individuals receiving care at OASIS demonstrated significant improvements across functional outcome domains over the course of the first year of treatment. There was a significant increase in the proportion of individuals meeting functional remission criteria from baseline to 1 year, and like symptom remission, fewer were able to sustain this level of functioning for two consecutive study visits. It is notable that in all cases, the sustained functional remission occurred between 6 months and 1 year, suggesting that enduring functional gains may take longer than symptomatic ones. Rates of functional remission were also much lower than rates of symptom remission, which has been widely observed in early psychosis using varying definitions of functional recovery [26, 31–36]. Longer follow-up is needed to determine the ultimate sustained functional recovery rates.

This is the first examination of a multi-element treatment center for early psychosis in the US. The prospective

longitudinal study design allowed for careful examination of the characteristics of an early psychosis cohort presenting to a specialized, phase-specific treatment program, as well as the course of the first year of treatment. The use of well-validated measures of symptoms and a consensus definition of symptom remission permits comparisons of key outcomes across the early intervention literature based on standards of care set forth in the International Declaration on Early Psychosis [19, 30, 37–39].

Despite the benefits of the study's naturalistic prospective design, the lack of a control sample is one of the study's chief limitations, and we cannot confidently infer that outcome changes were due to the treatment offered at OASIS. A second caveat pertains to the short follow-up period examined in the present study. Longer follow-up periods are needed to better understand the more prolonged recovery trajectory. Finally, raters were not trained to reliability for the purpose of this study and raters were not blind to clinical status, as study evaluations were conducted by full-time clinicians as part of routine care. Furthermore, because data were collected before or during sessions otherwise dedicated to case management, therapy, and medication management, the demands of clinical care may naturally have taken precedence over data collection, thereby contributing to some of the missing data in this study. Indeed, consistent outcome evaluation may represent an ongoing administrative challenge for programs with fewer resources [40].

In conclusion, this study provides preliminary evidence for the efficacy of a US-based multi-element treatment center in addressing the clinical needs of an early psychosis population and improving short-term outcomes. Furthermore, it lays the groundwork for successive more elaborate investigations, such as the NIMH-sponsored "Recovery After an Initial Schizophrenia Episode" (RAISE) program. The tri-fold goals of RAISE—to reduce the likelihood of long-term disability for individuals with schizophrenia; to increase the likelihood that these individuals will lead productive lives in the community; and to reduce the financial impact on public care systems—have informed a full-scale, randomized controlled trial that will evaluate interventions during the early stages of schizophrenia and related disorders. The RAISE-Early Treatment Program (ETP) study is a nationwide project comparing a package of phase-specific interventions to usual community care. The experimental condition includes an individual therapy called Individual Resiliency Training (which focuses on goals and strengths), family psychoeducation, supported employment and education, and individualized medication management using a computerized decision support system (N.R. Schooler, personal communication, October 11, 2011). All treatment is delivered by front line clinical staff. A total of 34 community clinics throughout the US are currently recruiting 400 patients who will receive at least 2 years of treatment and evaluation. Results from RAISE-ETP promise to shed further light on the benefits of early intervention while facilitating future service development. Continued evaluation of the multi-element treatment model is a necessary component of ongoing efforts to identify best practice in intervention for early psychosis, and in providing widespread access to optimal, evidence-based care.

Acknowledgments The authors would like to acknowledge the contributions of the following individuals: Lyse de Bourguignon, LCSW, Brent Moos, LCSW, Dionysios Kakouras, LCSW (OASIS clinicians); Lisa Cooper (OASIS administrative staff); Daniel Bauer, PhD and Christopher Wiesen, PhD (statistical consulting); Lauren Catalano and Sierra Carter (data entry); Charles Thayer and Abby Scheer (data management); Benjamin Buck, Kristin Coconis, Kelsey Ludwig, and Charles Olbert (manuscript editors). Support for OASIS program development has been provided by the Duke Endowment and the Kate B. Reynolds Charitable Trust as well as by NIMH grant R34 1-MH071252-01A1 awarded to DLP, as well as the UNC Department of Psychiatry. This paper was presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY (November 19–22, 2009).

Conflict of interest The authors have no interests to disclose.

References

1. McGorry PD (2004) Value of early intervention in psychosis. Br J Psychiatry 185:172 (author reply 172–173)
2. Owen A (2003) What is early intervention. Br J Psychiatry 183:562
3. McGorry PD, Edwards J, Mihalopoulos C, Harrigan SM, Jackson HJ (1996) EPPIC: an evolving system of early detection and optimal management. Schizophr Bull 22:305–326
4. Malla AK, Norman RMG, McLean TS, Scholten D, Townsend LA (2003) A Canadian programme for early intervention in non-affective psychotic disorders. Aust N Z J Psychiatry 37:407–413
5. Addington J, Leriger E, Addington D (2003) Symptom outcome 1 year after admission to an early psychosis program. Can J Psychiatry 48(3):204–207
6. Jorgensen P, Nordentoft M, Abel MP, Gouliaev G, Jeppesen P, Kassow P (2000) Early detection and assertive community treatment of young psychotics: the OPUS trial, rationale and design of the trial. Soc Psychiatry Psychiatr Epidemiol 35:283–287
7. Malla AK, Norman RM, Joober R (2005) First-episode psychosis, early intervention, and outcome: what have we learned? Can J Psychiatry 50(14):881–891
8. Penn DL, Waldheter EJ, Perkins DO, Mueser KT, Lieberman JA (2005) Psychosocial treatment for first-episode psychosis: a research update. Am J Psychiatry 162:2220–2232
9. Srihari VH, Breitborde NJK, Pollard J, Tek C, Hyman L, Frisman LK, McGlashan TH, Jacobs S, Woods SW (2009) Early intervention for psychotic disorders in a community mental health center. Psychiatr Serv 60(11):1426–1428
10. Lukoff D, Liberman RP, Nuechterlein KH (1996) Symptom monitoring in the rehabilitation of schizophrenia patients. Schizophr Bull 12:578–603
11. Velligan D, Prihoda T, Dennehy E, Biggs M, Shores-Wilson K, Crimson ML, Rush AJ, Miller A, Suppes T, Trivedi M, Kashner

TM, Witte B, Toprac M, Carmody T, Chiles J, Shon S (2005) Brief psychiatric rating scale expanded version: how do new items affect factor structure? Psychiatry Res 135:217–228
12. Kopelowicz A, Ventura J, Liberman RP, Mintz J (2008) Consistency of brief psychiatric rating scale factor structure across a broad spectrum of schizophrenia patients. Psychopathology 41:77–84
13. Andreasen NC, Carpenter WT, Kane JM, Lasser RA, Marder SR, Weinberger DR (2005) Remission in schizophrenia: proposed criteria and rationale for consensus. Am J Psychiatry 162:441–449
14. Drake RE, Mueser KT, McHugo GJ (1996) Clinician rating scales: Alcohol Use Scale (AUS), Drug Use Scale (DUS), and Substance Abuse Treatment Scale (SATS). In: Sederer LI, Dickey B (eds) Outcomes assessment in clinical practice. Williams & Wilkins, Baltimore, pp 113–116
15. American Psychiatric Association (2000) Diagnostic and statistical manual of mental disorders (DSM-IV-TR). American Psychiatric Association, Washington, DC
16. Goodman SH, Sewell DR, Cooley EL, Leavitt N (1993) Assessing levels of adaptive functioning: the Role Functioning Scale. Community Ment Health J 29(2):119–131
17. Cohen J (1988) Statistical power analysis for the behavioral sciences. Erlbaum, Hillsdale
18. PASW Statistics 18, Release Version 18.0.0. SPSS Inc., Chicago
19. Addington D, Norman R, Adair CE, Manchanda R, McKenzie E, Mitchell B, Pryce C (2009) A comparison of early psychosis treatment services using consensus and evidence-based performance measures. Early Interv Psychiatry 3(4):274–281
20. Meneghelli A, Cocchi A, Preti A (2010) 'Programma2000': a multi-modal pilot programme on early intervention in psychosis underway in Italy since 1999. Early Interv Psychiatry 4(1):97–103
21. Conus P, Cotton S, Schimmelmann BG, McGorry PD, Lambert M (2007) The First-Episode Psychosis Outcome Study: premorbid and baseline characteristics of an epidemiological cohort of 661 first-episode psychosis patients. Early Interv Psychiatry 1:191–200
22. Garety PA, Rigg A (2001) Early psychosis in the inner city: a survey to inform service planning. Soc Psychiatry Psychiatr Epidemiol 36:537–544
23. McEvoy JP, Lieberman JA, Perkins DO, Hamer RM, Gu H, Lazarus A, Sweitzer D, Olexy C, Weiden P, Strakowski SD (2007) Efficacy and tolerability of olanzapine, quetiapine, and risperidone in the treatment of early psychosis: a randomized, double-blind 52-week comparison. Am J Psychiatry 164:1050–1060
24. Emsley R, Rabinowitz J, Medori R (2007) Remission in early psychosis: rates, predictors, and clinical and functional outcome correlates. Schizophr Res 89:129–139
25. Cocchi A, Meneghelli A, Preti A (2008) Programma 2000: celebrating 10 years of activity of an Italian pilot programme on early intervention in psychosis. Aust N Z J Psychiatry 42(12):1003–1012
26. Menezes N, Malla A, Norman R, Archie S, Roy P, Zipursky R (2009) A multi-site Canadian perspective: examining the functional outcome from first-episode psychosis. Acta Psychiatr Scand. doi:10.1111/j.1600-0447.2009.01346.x
27. Addington J, Addington D (2008) Symptom remission in first episode patients. Schizophr Res 106:281–285
28. Craig TJ, Fennig S, Tanenberg-Karant M, Bromet EJ (2000) Rapid versus delayed readmission in first-admission psychosis: quality indicators for managed care? Ann Clin Psychiatry 12(4):233–238
29. Petersen L, Jeppesen P, Thorup A, Abel M-B, Ohlenschlaeger J, Christensen TO, Krarup G, Jorgensen P, Nordentoft M (2005) A randomised multicentre trial of integrated versus standard treatment for patients with a first episode of psychotic illness. Br Med J 331(7517):602
30. Addington D (2009) Improving quality of care for patients with first-episode psychosis. Psychiatr Serv 60(9):1164–1166
31. Cassidy CM, Norman R, Manchanda R, Schmitz N, Malla A (2009) Testing definitions of symptom remission in first-episode psychosis for prediction of functional outcome at 2 years. Schizophr Bull. doi:10.1093/schbul/sbp1007
32. Crumlish N, Whitty P, Clarke M, Browne S, Kamali M, Gervin M, McTigue O, Kinsella A, Waddington JL, Larkin C, O'Callaghan E (2009) Beyond the critical period: longitudinal study of 8-year outcome in first-episode non-affective psychosis. Br J Psychiatry 194:18–24
33. Emsley R, Oosthuizen PP, Kidd M, Koen L, Niehaus DJH, Turner HJ (2006) Remission in first-episode psychosis: predictor variables and symptom improvement patterns. J Clin Psychiatry 67(11):1707–1712
34. Petersen L, Thorup A, Oqhlenschlaeger J, Christensen TO, Jeppesen P, Krarup G, Jorrgensen P, Mortensen EL, Nordentoft M (2008) Predictors of remission and recovery in a first-episode schizophrenia spectrum disorder sample: 2-year follow-up of the OPUS trial. Can J Psychiatry 53(10):660–670
35. Whitehorn D, Brown J, Richard J, Rui Q, Kopala L (2002) Multiple dimensions of recovery in early psychosis. Int Rev Psychiatry 14:273–283
36. Wunderink L, Sytema S, Nienhuis FJ, Wiersma D (2009) Clinical recovery in first-episode psychosis. Schizophr Bull 35(2):362–369
37. Bertolote J, McGorry P (2005) Early intervention and recovery for young people with early psychosis: consensus statement. Br J Psychiatry 187(Suppl 48):s116–s119
38. Addington DE, McKenzie E, Addington J, Patten S, Smith H, Adair C (2007) Performance measures for evaluating services for people with a first episode of psychosis. Early Interv Psychiatry 1(2):157–167
39. Addington D, McKenzie E, Addington J, Patten S, Smith H, Adair C (2005) Performance measures for early psychosis treatment services. Psychiatr Serv 56:1570–1582
40. Fisher H, Theodore K, Power P, Chisolm B, Fuller J, Marlowe K, Aitchison KJ, Tanna R, Joyce J, Sacks M, Craig T, Johnson S (2008) Routine evaluation in first episode psychosis services: feasibility and results from the MiData project. Soc Psychiatry Psychiatr Epidemiol 43:960–967