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ORIGINAL ARTICLE

Sustainment of Four Evidence-Based Treatments for Patients with Psychosis: A Prospective Cohort Study in Norway

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Abstract

Research on sustainment of implemented evidence-based practices (EBPs) for people with psychosis has been limited in mental health services. This prospective cohort study extended a cluster-randomized trial (trial registration number NCT03271242) of implementation of four EBPs in Norwegian mental health services. In the trial 39 clinical units were randomized to receive implementation support for one of two chosen EBPs. This study aimed to measure sustainment for two biological EBPs (physical health care, antipsychotic medication management) and two psychosocial EBPs (family psychoeducation, illness management and recovery), and to explore factors influencing sustainment. Fidelity to the EBP with implementation support was measured after 18 months of implementation support and at 36 months (18 months post-implementation), additionally key informants reported factors influencing sustainment. Among 27 sites with high or moderate fidelity at 18 months, 20 (74%) sustained the practice at the same or higher level at 36 months; 10 of 13 sites, most with psychosocial EBPs, sustained high fidelity, and 10 of 14 sites, most with biological EBPs, sustained moderate fidelity. Sustaining sites demonstrated significantly greater efforts to continue the EBP, while non-sustaining sites encountered greater barriers including leadership change or key clinician turnover. With efforts to continue the EBP, most sites sustained the practice with high fidelity for psychosocial EBPs and moderate fidelity for biological practices. A clinical director or champion determined to continue the practice together with a trained clinical staff were the two main ingredients for sustainment.

Keywords Psychosis · Evidence-based practices · Fidelity · Sustainment · Factors

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Abbreviations

CFIR	Consolidated Framework for Implementation Research
CMHC	Community Mental Health Center
CPP	Care Pathway Project
CRCT	Cluster-Randomized Controlled Trial
CSS	Continuous Support Subscale
EBP	Evidence-Based Practice
IPAT	Implementation Process Assessment Tool
PHYS	Physical Health Care
MED	Antipsychotic Medication Management
FAM	Family Psychoeducation
IMR	Illness Management and Recovery

Introduction

Implementing evidence-based practices (EBPs) in health services provides no lasting benefits to patients without sustainment (Aarons et al., 2014). However, few studies examine sustainment of EBPs in mental health services. Sustainment is challenging in mental health services because many EBPs are complex interventions with multiple components delivered by several service providers and multiple professional disciplines (Bird et al., 2014).

The Cluster-Randomized Controlled Trial which the Current Study is Based on

A cluster-randomized controlled trial (CRCT) in Norway on 18 months implementation of four EBPs for treatment of people with psychosis offered an opportunity to extend the study to include sustainment of EBPs. In the CRCT, the 39 participating mental health clinical units each implemented two EBPs chosen from among four pre-selected EBPs identified by the research team: physical health care (PHYS), antipsychotic medication management (MED), family psychoeducation (FAM), and illness management and recovery (IMR) (Ruud et al., 2021). Through randomization, each site received 18 months of intensive implementation support for one practice and only the manual for the other practice. At 18 months 13 of the 39 sites (33%, 3 with FAM and 8 with IMR) had achieved high fidelity for the EBP with implementation support and 14 sites (36%, 6 with PHYS, 6 with MED, 2 with FAM) had achieved moderate fidelity. Of the 39 control sites, 2 (5%, 2 with IMR) had achieved high fidelity and 12 (31%, 2 with PHYS, 8 with MED,1 with FAM, 1 with IMR) had achieved moderate fidelity. Details on the implementation support and the effects of the implementation support for the four EBPs have been published in a previous paper (Ruud et al., 2021).

Research on Sustainment in Mental Health Services

Fidelity and sustainment have been identified as two of several key intermediate outcomes of implementation (Proctor et al., 2011). Fidelity scales measure the degree of adherence to specific model standards (Bond & Drake, 2020). Sustainment is in most studies continued practice components and activities beyond the end of the implementation period (Flynn et al., 2022; Lennox et al., 2018; Moore et al., 2017; Moullin et al., 2020; Shelton et al., 2018; Wiltsey Stirman et al., 2012). An operational definition of sustainment must include clear criteria showing how much of a practice's components need to be present to consider it sustained. (Scheirer & Dearing, 2011). Sustainability refers to the ability of the practice to continue after implementation, while sustainment means the actual continuation of the practice. (Berta et al., 2019; Chambers et al., 2013).

A review found that research on post-implementation sustainment in health services was limited and varied considerably, including for mental health interventions (Wiltsey Stirman et al., 2012). Most studies were retrospective and naturalistic, with half relying on self-reports. Only 16 (13%) used independent observation or fidelity assessment, and only 8 (7%) reported sustainment after a clinical trial intervention. Partial continuation of practices was more common than full continuation, and less than half of practices sustained high levels of fidelity or skills (Wiltsey Stirman et al., 2012). So far as we are aware, no established method for how to define and use fidelity scores as a measurement of sustainment exists (Wiltsey Stirman et al., 2012).

Many factors potentially influence sustainment. The Consolidated Framework for Implementation Research (CFIR), used to identify and categorize facilitators and barriers in studies on implementation, is the most widely used framework in sustainment studies (Damschroder et al., 2009; Flynn et al., 2022; Shelton et al., 2018). However, the included factors and associations with sustainment vary greatly (Flynn et al., 2022; Shelton et al., 2018).

Aims

This study aimed to examine sustainment at 36 months of four EBPs for the treatment of psychosis in 27 clinical units that had achieved high or moderate fidelity at 18 months (at the end of the implementation support) to answer the following research questions: (a) To what extent were high and moderate fidelity of the EBP sustained at 36 months? (b) Which factors influenced sustainment?

Methods

Study Design

The current study was a prospective cohort study without a control group. The study extended an CRCT (trial registration number NCT03271242) that examined the effects on implementation (fidelity) of 18 months of implementation support across 39 Norwegian mental health clinical units implementing EBPs for treatment of people with psychosis (Ruud et al., 2021). The control conditions in the CRCT were not monitored after the 18-month implementation period and were not included in the sustainment study.

The research group (the principal investigator, the local coordinators in the six health trusts, two service user representatives) planned, prepared, and conducted the CRCT, including organizing the implementation support. Each local coordinator led a project team within their health trust, recruited implementation facilitators and fidelity assessors, coordinated communications with clinical unit leaders, disseminated project information, and organized meetings for participating clinical units within the health trust. However, after the 18-month implementation period ended, the research group and the local project teams did not provide further support to the clinical units, leaving to the clinical unit to continue the practice independently.

Setting

Specialized mental health services in Norway are mostly public and provided by 19 health trusts, which also provide general hospital services and other specialized health services for all age groups (OECD, 2014; Ringard et al., 2013). In each health trust, the adult mental health and substance abuse services consist of acute and other inpatient hospital units, as well as community mental health centers (CMHCs) with outpatient clinics, mobile teams, and local inpatient units (Ruud & Friis, 2021). Each CMHC serves a local catchment area and collaborates with general practitioners and primary health and social care in the municipalities. Four regional health authorities own and fund the health trusts on behalf of the government. The public specialized mental health services cover all inpatient and outpatient services, except for a fee per outpatient consultation until a maximum annual amount per person, followed by free consultations the rest of the year. No financial incentives exist for providing specific treatments, including the four EBPs in the current study.

Sites Participating in the Study

The CRCT and the current study included mental health clinical units in six of the 19 Norwegian health trusts, serving 38% of the country's population in urban and rural areas across three of the four health regions. The announcement of research funding required that applications included health trusts from at least three health regions. We invited eight health trusts, and six accepted to participate.

The unit for analysis was a clinical unit providing services to adults or adolescents with psychosis. Data collection included all 39 sites that participated in the CRCT. However, the current study of sustainment was limited to the EBP for which the site was randomized to receive implementation support, and the analyses on sustainment included only the 27 sites that had achieved high or moderate fidelity for the intervention EBP at the end of the 18-month implementation period.

Evidence-Based Practices Included

For the CRCT, the research group selected four EBPs for patients with psychosis that met several criteria: treatments with strong evidence and/or importance in the Norwegian national guidelines for treatment of people with psychosis (Helsedirektoratet, 2013), relevance for most patients with psychosis, already partly established or with available training programs, and preference in a survey among the clinical units in the study. Two were biological practices (PHYS, MED) that all clinical units were already providing without quality measurement, and two were psychosocial practices (FAM, IMR) that were new to almost all clinical units. The components of the four EBPs are listed in Table 1. Previous papers described the four EBPs in detail (Egeland et al. 2020; Joa et al. 2020; Ruud et al. 2020a, b).

Intervention

The intervention evaluated in the parent study (CRCT) consisted of 18 months implementation support, which included the provision of a toolkit for the practice, training of clinicians, frequent visits by implementation facilitators, telephone supervision for the psychosocial practices, and feedback every 6 months from fidelity assessments and from questionnaires to clinicians on their experiences of the implementation process (Hartveit et al., 2019; Ruud et al., 2021). Details on the implementation support are available in a previous paper (Ruud et al., 2021).

In the current study, the project did not provide any intervention to support the sustainment of the four EBPs after the implementation support ended at 18 months. The clinical

Table 1 Components of the four evidence-based practices

Physical Health Care (PHYS)	Antipsychotic Medication Management (MED)	Family Psychoeducation (FAM)	Illness Management and Recovery (IMR)
Policy and procedures promoting and supporting physical fitness	Shared decision-making	FPE comprises several overlapping interventions to provide families with education, skills training, and support.	Psychoeducation to improve knowledge of mental illness
Policy and procedures monitoring cardiovascular risk factors and treating physical illnesses	Somatic assessment	FPE is provided in single-or multi-family formats.	Relapse prevention to reduce relapses and hospitalizations
Policy and procedures promoting and supporting healthy diet	Choice of antipsychotic medication	The format used in the current study included a number of meetings with patients and family members together, workshops for family members, workshops for patients, and a fortnightly multi-family group often extending over 1–2 years.	Behavioral training to improve medication adherence
Policy and procedures promoting and supporting smoking cessation	Dosage of antipsychotic medication		Coping skills training to reduce the severity and distress of persistent symptoms
Policy and procedures promoting and supporting dental and oral health	Limiting polypharmacy		Social training to strengthen social support.
	List of current medication and doses		
	Monitoring and improving adherence		
	Systematic measurement of symptoms		
	Monitoring side effects		
	Monitoring discontinuation of medication		

unit was responsible for sustaining the practice and for maintaining fidelity standards.

Measures

Outcome Measure

For this study we defined sustainment as continuation of the EBP at the same or higher fidelity level at 36 months compared to fidelity level (high or moderate fidelity) at the end of the 18-month implementation period.

We used the Physical Health Care Fidelity Scale, the Antipsychotic Medication Management Fidelity Scale, the Family Psychoeducation Fidelity Scale, and the Illness Management and Recovery Fidelity Scale. Previous papers reported good to excellent psychometric properties for these fidelity scales in the CRCT(Egeland et al. 2020; Joa et al. 2020; Ruud et al. 2020a, b).

All four fidelity scales had the same format and scoring, with multiple items rated on a 5-point scale for adherence to the practice guidelines (from 1 = lack of adherence to 5 = full adherence) (Bond & Drake, 2020). We calculated a total mean fidelity score for each scale as the unweighted sum of item scores, divided by the number of items. A score of 4.00 or higher was considered high fidelity, a score of 3.00-3.99 moderate fidelity, and lower than 3.00 low fidelity (McHugo et al., 2007) .

Measures of Factors Likely to Influence Sustainment

Measures of factors likely to influence sustainment were included in a semi-structured interview consisting of a section with four open-ended questions, followed by a section with 20 statements to be rated on three-point response scales.

To categorize factors likely to influence the sustainment of the four EBPs, we used the Consolidated Framework for Implementation Research (CFIR) which defines the following groups of factors: characteristics of the intervention, outer setting (e.g., national policies, resources), inner setting (e.g., culture, engagement, leadership), characteristics of individuals, and process (e.g., plan, evaluation) (Damschroder et al., 2009). For characteristics of the four complex interventions (EBPs) and the process, we used our knowledge about these. For outer and inner settings, we defined a manageable number of 15 elements likely to influence sustainment, and additionally we used the five items Continuous Support Subscale (CSS) from the Sustainability Implementation Scale (Bergmark et al., 2018; Markstrom et al., 2018).

The 15 elements were based on our knowledge of the national health policies and the mental health services in the six health trusts, in line with the guidance for complex interventions from the British Medical Research Council (Craig et al., 2008). For the inner setting, we chose elements regarding leader decisions and priorities, clinician engagement with the practice, methods used to continue the practice, and changes in staff or organization of the clinical unit. For the outer setting, we chose elements regarding the potential influence of the mandatory implementation of a national Care Pathway Project (CPP) for provision of health services to people with psychosis. We hypothesized that CPP might decrease the sustainment of the four EBPs as a competing priority that would reduce the focus on, and allocation of resources to, sustainment (Helsedirektoratet, 2018). We considered that the 15 elements were adequate reflections of the constructs to be measured and had an acceptable face validity (Mokkink et al., 2018).

The 15 elements were rated on a three-point scale regarding the degree of influence on sustainment (1 = “no/not”, 2 = “to some degree, 3 = “to a large degree”). We conducted

a factor analysis of the 15 elements, and 14 of them loaded on one of three factors. These elements are shown in detail in the factor analysis in Table A in the online Supplementary Material. The three factors (listed with number of elements and Cronbach's alpha for internal consistency) were: Joint Efforts to Continue Practice (9 elements, alpha 0.94), Implementation of the CPP (2 elements, alpha 0.87), and Changes in Staff and Organization (3 elements, alpha 0.69). The factors could be facilitators or barriers.

The CSS contained five items on specific strategies for support of sustainment: ongoing education, ongoing guidance, repeated measurement of fidelity, time for evaluation, and technical support. The scale was developed and tested in Sweden with an internal consistency of alpha 0.85 (Bergmark et al., 2018; Markstrom et al., 2018). Each strategy was rated on a three-point scale regarding how much each strategy was in place (1 = "not", 2 = "partly", 3 = "completely") with specific anchoring formulations for each step of each item. The developers did no factor analysis of CSS. We did an explorative factor analysis that confirmed that CSS consisted of one factor with alpha 0.93.

The four open-ended questions addressed how continuation of the practice had proceeded, the three most important conditions for being able to continue the practice, the three most important conditions for not being able to continue the practice, and the relationship between continuing the practice and implementing the CPP. These questions were adapted from the interview schedule used in a previous US study on sustainment of five EBPs (Swain et al., 2010).

Data Collection and Procedures

Fidelity assessments were conducted at 18 months (March-April 2018) and 36 months (October-December 2019). For each clinical unit two trained assessors rated fidelity for the specific practice. Most assessors were the same as in previous assessments (at baseline, 6 and 12 months), and they participated in a refresher training session for the 36-month assessment. The fidelity assessors conducted site visits in person, rated fidelity independently, and resolved discrepancies by consensus. The fidelity visits for all four EBPs included interviews with key informants (leaders and key clinicians) and inspection of written material. The assessment also included rating documentation found in 10 randomly selected patient records at sites with PHYS and MED, and documentation of performance of the practice at sites with FAM and IMR. The semi-structured interview with key informants about conditions and elements likely to influence sustainment was conducted at the fidelity assessment or at a follow-up shortly after (in-person or by phone), where the informants had the interview form in front of them with open questions and items to be scored, and the interviewers wrote down the answers and ratings.

Data Analysis

We examined distribution of fidelity ratings of sites within each EBP at 18 and 36 months, as well as the distribution of changes in fidelity ratings between 18 and 36 months. We also reported fidelity scores (mean, SD) at 18 and 36 months and mean changes in fidelity scores for site subgroups based on fidelity levels for each EBP at 18 months. We used line diagrams to show mean fidelity scores at 0 months (start of implementation), 18 months (end of implementation period), and 36 months (sustainment measured) for the four EBPs and for the sites within each EBP.

For the four inner and outer setting factors, we reported descriptive statistics (mean, SD) for sustaining and non-sustaining sites, and the significance of differences between these groups based on t-test with significant p-value set to <0.05. For statistical data analysis, we used SPSS version 28.

We analyzed the written answers from the open-ended questions following recommended steps for thematic analysis (Braun & Clarke, 2006). After a thorough reading of the answers, we generated initial codes for extracts, identified themes and codes related to each theme, reviewed themes and codes to achieve a satisfactory thematic map. The thematic analysis was done by one researcher and reviewed by another, leading to consensus on final codes and themes. Finally, we used a realist and deductive approach to examine how facilitators and barriers of each theme were related to sustaining and non-sustaining sites, and if any of these were better covered by elements with closed response scales.

Results

Sustainment

Table 2 shows the number of intervention sites for each EBP, and distribution on fidelity levels at 18 and 36 months. At 36 months, 20 of 27 sites (74%) sustained the practice: 10 of 13 sites (77%) with high fidelity (including one site with PHYS improving from moderate fidelity), and 10 of 14 sites (71%) with moderate fidelity.

Table 2 also shows fidelity scores at 18 and 36 months and changes for site subgroups based on EBPs and fidelity levels at 18 months. An inspection of the results for all sites revealed that 15 sites had a change in mean fidelity less than 0.50 (all sustained), 7 had a change in mean fidelity between 0.50 and 0.99 (5 sustained, 2 not), and 5 had a

Table 2 Fidelity levels and scores for high and moderate fidelity level at 18 and 36 months

Distribution of intervention sites on high and moderate fidelity level at 18 and 36 months						
Results at each point in time	Fidelity**	Evidence-based practices*				
		PHYS	MED	FAM	IMR	All
Randomized to intervention site		13	8	7	11	39
Implemented at 18 months (After 18 months with support)	High	0	0	3	10	13
	Moderate	6	6	2	0	14
	Total	**6**	**6**	**5**	**10**	**27**
Implemented at 36 months (After 18 months without support)	High	1	0	3	6	10
	Moderate	3	6	1	0	10
	Total	**4**	**6**	**4**	**6**	**20**

Descriptive statistics of fidelity scores at 18 and 36 months, and for changes from 18 to 36 months					
Evidence-based practice*	Fidelity level at 18 months	Sites	Fidelity score at 18 months	Fidelity score at 36 months	Change in fidelity from 18 to 36 months
			Mean (SD)	Mean (SD)	Mean (SD)
PHYS	Moderate	6	3.4 (0.3)	3.2 (0.5)	-0.2 (0.3)
MED	Moderate	6	3.4 (0.3)	3.2 (0.2)	-0.2 (0.5)
FAM	High	3	4.4 (0.1)	4.3 (0.3)	-0.1 (0.4)
	Moderate	2	3.7 (0.2)	2.0 (0.4)	-1.6 (1.5)
IMR	High	10	4.8 (0.3)	3.3 (1.9)	-1.5 (1.8)

change in mean fidelity above 1.00 (range 2.69 to 3.85, none sustained).

Figure 1 displays line graphs with mean fidelity scores at 0, 18 and 36 months. The first graph displays the fidelity for the four EBPs. IMR showed a sharp decline in mean fidelity from 18 to 36 months, in contrast to the other three practices with small changes in mean fidelity during this period. The remaining four graphs display fidelity for the specific clinical units within each EBP. Sites implementing the two biological EBPs showed modest changes in fidelity between 18 and 36 months. By contrast, IMR sites exhibited a pattern of either continued high fidelity or a sharp decline in fidelity at 36 months. FAM sites displayed a mixture of these two patterns.

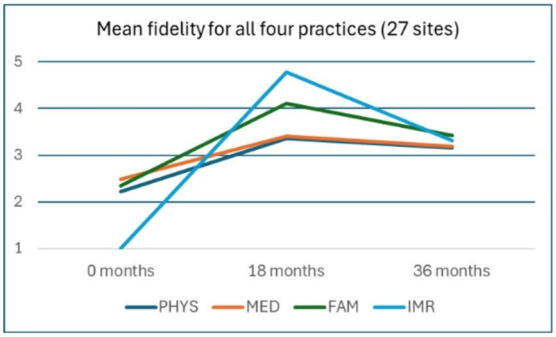
Factors Influencing Sustainment

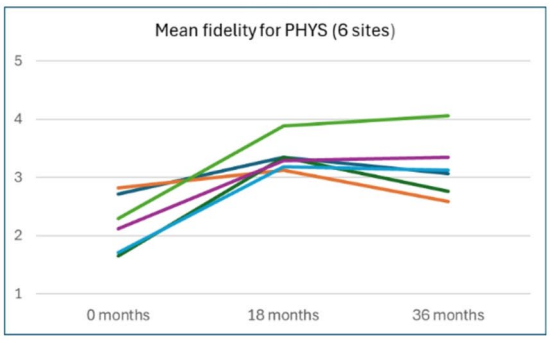
Table 3 summarizes differences in influence of the four inner and outer setting factors between the sustaining and non-sustaining sites. Key informants from the sustaining sites reported significantly larger joint efforts of leaders and clinicians to continue the practice, and significantly fewer changes in staff and organization. Differences regarding the implementation of the CPP and the use of supportive strategies (CSS) were not significant.

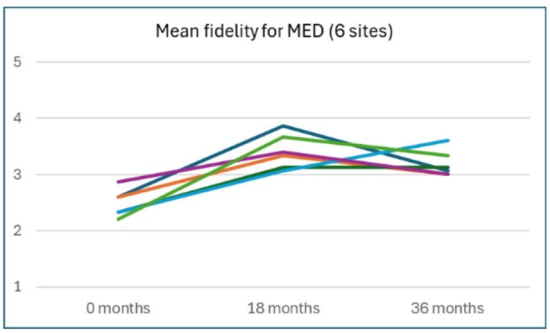
In the thematic analysis of the first open-ended question on how the practice had been continued, 9 sites answered that it had been continued, 8 sites answered not, and 10 sites did not give a clear answer. However, only 14 of the 27 answers were consistent with the sustainment measured by fidelity at 36 months, indicating that this question was not clearly enough worded to give adequate information.

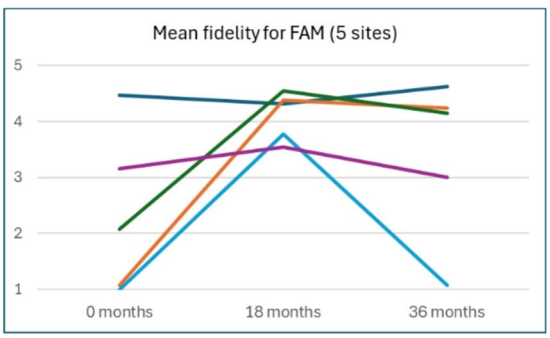
Analysis of the answers to the two questions on conditions that were perceived facilitators and barriers to continuing the practice, showed that 83 coded extracts from 25 sites were distributed on 15 codes within 4 themes. Almost half of the extracts were on the theme "Available resources", which were mostly reported as facilitators from sustaining sites (competences/skills, established procedures, available clinicians, allocated resources, clinician engagement, motivating feedback, and seeing results). The remaining extracts, mostly reported as facilitators at sustaining sites and as lacking (barriers) at non-sustaining sites, were divided on three themes: "Support from leaders and clinicians", "Process in unit" (broad involvement, clear responsibilities, collaboration, priority of practice), and "Characteristics if the practice" (available patients, adoption of the material).

Answering the last question on the relationship between continuing the practice and implementing the CPP, 12 sites had experienced no problems, 7 had found the projects were mutually supportive, 2 that the CPP took the focus, 3 that the experience from implementing the EBP had been useful for implementing the CPP, and 3 gave no answer. One sustaining site reported that implementing the CPP took the focus, compared to 18 that did not, and the reporting from the non-sustaining sites was 1 versus 4.









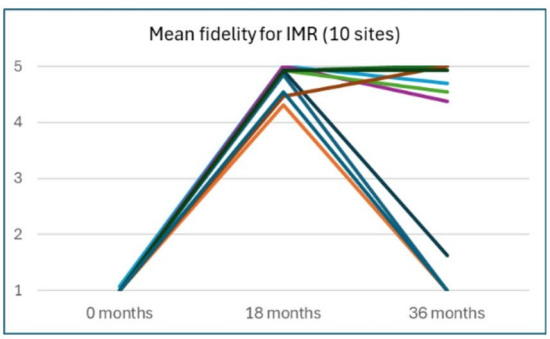


Fig. 1 Mean fidelity for the four practices* and units at 0 months (baseline), 18 months (end of implementation support), and 36 months for the 27 sites with high or moderate fidelity at 18 months

Discussion

Sustainment

At 36 months, 18-month after the end of the implementation period with implementation support, 20 (74%) of the 27 sites with high or moderate fidelity at 18 months had sustained their practice at the same or higher level: 10 with high fidelity and 10 with moderate fidelity. All sites with biological practices and those sustaining psychosocial practices showed small or moderate changes in mean fidelity scores. Seven sites had discontinued providing their psychosocial practices, as shown by large reductions in mean fidelity scores from 18 to 36 months.

The differing sustainment patterns between biological and psychosocial practices may be partially due to their inherent characteristics. Psychosocial practices, new to most sites, involved a small number of designated, trained staff and a structured, manualized program for a limited group of patients, making high fidelity more attainable but also more vulnerable to disruptions when trained staff departed. In contrast, biological practices were widely used treatments for most patients with psychosis and involved many staff members, making high fidelity challenging to achieve but moderate fidelity easier to maintain.

Despite many similarities between the two psychosocial practices, four IMR intervention sites discontinued the practice compared to one FAM intervention site. One reason for this may be that elements of FAM were previously better known than IMR and partly practiced in some of the clinical units, as also indicated by the differences between FAM and IMR in the fidelity at baseline (0 months) in Fig. 1. Additionally, IMR was a more complex program consisting of a larger curriculum and many different modules. These two factors probably made continued implementation of IMR more dependent of trained clinicians and contributed to a higher risk for discontinuing IMR if trained clinicians left the clinical unit or unit leaders changed priorities.

The proportion of sustained EBPs in our study aligns with findings from several reviews on sustainment. With follow-up periods of two years for most studies, one review noted that less than 50% of providers in studies with independent fidelity assessments maintained high-fidelity practices (Wiltsey Stirman et al., 2012), while another review found that 60% of health-related sites sustained at least one practice component (Scheirer, 2005). However, reviews of the sustainment literature have not detailed specific sustainment measurements, making it difficult to draw firm conclusions across studies (Flynn et al., 2022; Scheirer, 2005; Shelton

Table 3 Difference between sustained and non-sustained sites for factors likely to influence sustainment. Mean with standard deviation (SD) and standard error (SE)

Factors	Sustained ($N=20$)	Not sustained ($N=7$)	Differences	T-test
	Mean (SD)	Mean (SD)	Mean (SE)	*p*
Joint Efforts to Continue Practice	2.6 (0.5)	1.5 (0.4)	1.1 (0.2)	**<0.001**
Changes in Staff and Organization	1.2 (0.3)	1.7 (0.8)	-0.5 (0.2)	**0.010**
Implementation of the Care Pathway Project	1.2 (0.5)	1.4 (0.7)	-0.2 (0.2)	0.366
Continuous Support Scale	1.8 (0.6)	1.4 (0.1)	0.4 (0.2)	0.094

et al., 2018; Wiltsey Stirman et al., 2012). A previous study on sustainment of similar EBPs in the U.S. National Implementing Evidence-Based Practices (NIEBP) Project found that 80% of programs were sustained after two years, with FAM sustained by 75% of sites and IMR by 67% (Swain et al., 2010). In our study, FAM and IMR were sustained with high fidelity at 100% and 60% of sites, respectively. The NIEBP Project's sustainment definition relied on key informant reports and did not include fidelity assessments, making comparisons with our study tentative.

In our study, we measured fidelity and sustainment, two intermediate implementation outcomes identified by Proctor et al. (2011). We did not assess adaptations. However, some adaptations of IMR were indicated in responses to open-ended questions, such as adaptation to inpatient settings or other patient groups.

Factors Influencing Sustainment

The inner setting factor that most significantly influenced sustainment was Joint Efforts to Continue Practice. The factor appeared to facilitate sustainment, with many of the elements present to a large degree in most of the sustaining sites, and to a small degree in most non-sustaining sites. This factor included both leader support and clinician engagement, as well as practice maintenance as clinical routines. We found the same pattern in the answers to open-ended questions. As shown in Fig. 1, the four intervention sites for IMR that did not sustain high fidelity had a fidelity of 1 at 36 months. The answers to open-ended questions and the ratings on the elements of inner setting factors for these sites showed that they had discontinued implementing IMR. The reasons for this were that clinicians who were central in IMR had left the clinical unit, changes in unit leadership, and that unit managers did not prioritize and support continued provision of IMR.

Changes in Staff and Organization, the other significant factor, appeared to be a barrier for sustainment due to the elements on key clinicians leaving the unit and leadership changes. We also found examples of this in the thematic analysis.

Unit leaders may facilitate or hinder sustainment. In previous studies, inner setting transformational leadership predicted sustainment and passive-avoidant leadership predicted non-sustainment (Aarons et al., 2016), and practitioners providing high fidelity IMR stressed that leaders should be engaged in the intervention and committed to maintaining clear goals and visions for sustainment (Egeland et al., 2019). Leadership was also a factor differentiating sustaining sites from non-sustaining sites in the NIEBP Project (Swain et al., 2010). Similarly, key clinicians often serve as champions in implementing and sustaining new or improved practices (Innis et al., 2015).

Funding has emerged as a key factor in several sustainment studies, particularly in the U.S. (Swain et al., 2010; Wiltsey Stirman et al., 2012). However, we did not include this as a potential outer setting factor in our study, because in Norway these services are funded with block grants with no separate funding for EBPs, meaning continuation decisions were independent of specific funding maintenance or withdrawal.

The sustainment evaluation period of 18 months is a process factor that may have influenced sustainment. Reviews have shown evaluation periods from 12 months to several years and suggested sustainment evaluation multiple times over several years (Flynn et al., 2022; Shelton et al., 2018; Wiltsey Stirman et al., 2012), as it was done in the NIEBP Project (Bond et al., 2014; Peterson et al., 2014; Swain et al., 2010).

Strengths and Limitations

Strengths of the study were that it was prospective and incorporating fidelity into the sustainment measurement using fidelity scales rated by independent fidelity assessors. The fidelity scales for each of the four EBPs have demonstrated acceptable psychometric properties but differ in content and other characteristics, complicating direct comparisons. A limitation was the small sample size of sites for each of the four EBPs. Most measurements of factors likely to influence sustainment were developed especially for our study and lacked previous validation.

Conclusions

Most sites that successfully had implemented the practice sustained the fidelity at the same level 18 months after the implementation period. High fidelity was sustained by most

sites for psychosocial EBPs, moderate fidelity by most sites for biological practices. Sustaining sites demonstrated significantly greater joint efforts by leaders and clinicians to continue the practice, encountering fewer leadership changes and fewer key clinicians leaving the unit. In contrast, non-sustaining sites faced barriers such as insufficient continuation efforts, leadership changes, and key clinicians leaving the unit. Greater focus is needed on sustainment EBPs for treating people with psychosis.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10488-026-01493-y.

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Authors' Contributions TR was principal investigator, did parts of the statistical analyses and the thematic analysis (together with MH), and drafted and revised the manuscript. MLS did parts of the data analyses and drafted parts of the Methods and Results. MH, KD, KH, TSH, VØH, IJ, JOJ, KJJ, BS, EWH, HC and EB participated in planning and preparing the study, organized the data collection, and participated in revising the manuscript. RED and GRB participated in planning and preparing the study and in revising the manuscript. All authors approved the final manuscript.

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Data Availability The data that supports the findings in the current study are available from the corresponding author (TR), upon reasonable request.

Declarations

Conflict of interest None.

Consent for Publication Not applicable.

Ethics Approval and Consent to Participate The key informants gave verbal informed consent to participate in the current study and give information on the sustainment in their clinical unit. The preceding cluster-randomized clinical trial was approved by the Regional Committee for Medical and Health Research Ethics in Southeastern Norway (reg. no. REK 2015/2169) and by the data protection officer for each participating health trust. The study followed the principles in the Declaration of Helsinki. The manager of each clinical unit signed a written consent to participate in the trial, including consent to randomization.

Methods guidelines followed STROBE guidelines for cohort studies (von Elm 2007. Lancet.2007;370(9596):1453-1457).

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