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Feasibility, acceptability and preliminary evaluation of a user co-facilitated psychoeducational programme: a feasibility proof-of-concept randomised control trial

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Abstract

Background Mental health settings are increasingly using co-facilitation of educational group interventions in collaboration with patient partners and service users. However, despite promising results, limited information is available regarding the feasibility and satisfaction levels of these programmes among adults newly diagnosed with attention-deficit hyperactivity/impulsivity disorder (ADHD). Hence, this study aimed to determine the feasibility, acceptability, and preliminary effects of a user co-facilitated psychoeducational group programme for adults diagnosed with ADHD.

Methods This feasibility proof-of-concept randomised controlled trial recruited outpatients from a Norwegian community mental health centre. Outpatients randomised to the intervention group (IG) received a psychoeducational programme supplementing Treatment As Usual (TAU), while the control group received TAU. Feasibility was determined by the acceptance rate, adherence rate, and dropout rate. Acceptability was measured with the Client Satisfaction Questionnaire and a 3-item scale measuring satisfaction with the received information. To test the preliminary effects, self-efficacy, symptom severity, and quality of life were measured at baseline and pre- and post-intervention.

Results Feasibility was demonstrated; most of the patients were willing to enrol, participants attended 82% of the psychoeducational programme, and only 13% dropped out of the study. The between-group analyses revealed that the IG reported significantly greater mean satisfaction than the CG. Moreover, the intervention group was more satisfied with the information they received during the psychoeducational programme. Concerning the preliminary effects, the linear mixed model showed improvement in quality of life (the subscale relationship); however, other patient-reported outcomes did not show improvements.

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Conclusions This proof-of-concept randomised controlled trial supports the feasibility and acceptability of the user co-facilitated psychoeducational programme for patients newly diagnosed with ADHD in an outpatient setting. While preliminary findings indicate promise in enhancing patient-reported outcomes, a larger study is warranted to assess the intervention's effectiveness rigorously.

Trial registration NCT03425, 09/11/2017.

Keywords Adult ADHD, Co-creation, Feasibility, Group treatment, Patient education, Patient satisfaction, Peer co-led, Psychoeducation, Randomised controlled trial, Self-efficacy, Self-management, User-centred design

Introduction

Attention-deficit hyperactivity/impulsivity disorder (ADHD) is a long-term neurodevelopmental disorder [1] that can have a negative impact on adults and children [2, 3]. Among adults, the average prevalence rate has been estimated at 2.8% [4]. The main symptoms of the disorder include inattentiveness, hyperactivity, and impulsivity. In addition, individuals with ADHD often experience the burden of psychiatric comorbidity [5–9], and research findings indicate that comorbidity rates with disorders including anxiety and depression are high among adult patients with ADHD [10, 11]. ADHD is also associated with functional impairments that affect work performance, psychosocial functioning [12, 13], educational functioning [1, 14] and quality of life [15]. Moreover, adults with ADHD have fewer psychological protective factors, such as self-management skills [16, 17].

Self-efficacy is defined as a person's belief in their ability to control the complex demands of the environment through adaptive actions [18]. It plays an essential protective role in managing stressful situations [19] and may be important for improving patient participation in treatment. In addition, among patients with various chronic diseases, self-efficacy is positively associated with quality of life [20]. An increasing number of non-pharmacological interventions aim to improve the level of self-efficacy in adults with mental disorders [21–24]. Furthermore, peer-based and peer co-facilitated interventions can improve self-efficacy via vicarious experience and activating coping skills [25].

While different non-pharmacological treatments are well-documented for adult ADHD, there is potential for further improvement by incorporating psychoeducational programmes into ADHD treatment pathways. From a mental healthcare perspective, educational interventions represent one way to help newly diagnosed patients acquire the skills needed to independently self-manage their condition. These interventions can effectively support them in accepting, adjusting to and living with their ADHD symptoms [26]. Recent studies have demonstrated that outpatients diagnosed with ADHD require and are interested in learning about different aspects of their diagnosis [27–29]. For patients with ADHD, psychoeducational programmes help them

acquire knowledge and understand their disorder and the impairments it entails [30]. By providing appropriate information, an educational programme may facilitate patients' acceptance of the disorder and ameliorate negative emotions, such as guilt [30].

Psychoeducational interventions are treatment approaches that can be delivered during the treatment waiting time [31, 32], and in conjunction with standard clinical care [33], such as pharmacological treatment and psychotherapeutic sessions with psychologists. The interventions can be delivered individually or as a group intervention [30, 34–37] and may involve collaboration with peers and former patients [31, 33, 38–42]. According to the review conducted in 2024 [43], psychoeducational interventions playing a valuable role in supporting adults with ADHD by providing information, coping skills, and social support. Emerging evidence suggests that psychoeducation reduces the levels of core symptoms [34]; improves quality of life and self-efficacy [16, 35], enhances peer support [44]; and improves self-management skills, psychosocial functioning and health outcomes [32].

Professionals carry out and facilitate most educational group programmes [45–49], but emerging evidence suggests that educational groups co-facilitated in collaboration with service users improve self-management skills [32] and the usage of health services [25]. Co-facilitated educational group interventions within a community mental health centre resulted in improvements in knowledge about treatment options [31], increased patient activation, improved attendance [32, 50] and reduced dropout rates [39]. Findings also indicate that co-facilitating such interventions with a group approach might be beneficial as patients can learn from one another's experiences [51]. Furthermore, involving service users when planning and delivering educational group interventions provides a potential benefit to the patients and has the potential to affect service delivery and development [51–53]. However, according to recent reviews, involvement in developing interventions and research co-design is rarely evaluated empirically [43, 54, 55].

According to European mental health policy [56] and recent studies [25, 27, 28], there is an increasing need to involve service users when planning and implementing

interventions in community mental health settings. In addition, a recent scoping review [43] suggested the need to use a co-facilitated approach during the delivery of the intervention, which more effectively helps to inform patients about available services outside the public healthcare system. However, to date, there are no feasibility studies evaluating psychoeducational group programmes co-facilitated and developed for adults newly diagnosed with ADHD in community mental health settings.

Feasibility studies play an important role in evaluating interventions, examining factors such as recruitment capacity, data collection procedures, the accessibility and suitability of the intervention, resource availability, and the preliminary participant response [57]. Acceptability, in turn, assesses the satisfaction and perceived appropriateness of an intervention based on expected or experienced emotional and cognitive reactions [58]. However, there is a lack of studies investigating whether patients diagnosed with ADHD in clinical settings are satisfied with psychoeducational interventions, and the acceptability of user co-facilitated interventions has yet to be investigated. To fill this gap in knowledge, we conducted a feasibility proof-of-concept randomised controlled trial study on outpatients from a Norwegian community mental health centre. The primary aim of this feasibility proof-of-concept study is to determine the feasibility and acceptability of a user co-facilitated psychoeducational programme for adults with ADHD. The secondary aim is to investigate the preliminary effects of the programme on self-efficacy, ADHD symptoms and quality of life.

Methods

Study design and participants

In this feasibility proof-of-concept study, we used a parallel two-arm randomised controlled trial (RCT) design with 1:1 allocation. The intervention is described according to TIDieR guidelines [59], and the report of the RCT is done according to CONSORT guidelines [60]. The psychoeducational programme took place at two centres, but due to the limited participation of user representatives one of the centres was excluded from this study [37]. Recruitment took place between November 2017 and March 2018.

Recruitment

Patients diagnosed with ADHD who underwent outpatient treatment at the community mental health centre were eligible for inclusion. These patients were informed about the study via flyers delivered by their therapists. Patients interested in the study were contacted via mail and invited to an in-person meeting at the outpatient clinic. The inclusion criteria were as follows: age between 18 and 67 years, fluency in Norwegian, Swedish

or Danish language, a confirmed diagnosis of ADHD according to DSM-IV, and willingness to participate in the study. Patients were excluded from participation if they had a psychotic disorder, severe learning difficulties, or were unable to give informed consent (i.e. the clinician deemed the patient severely cognitively impaired and unable to understand the risks and benefits of the study participation) [61]. Patients were also excluded if they were currently taking part in any other research project or had received prior group therapy for ADHD. Patients eligible for inclusion were given written and oral information about the study. Participants were required to provide written informed consent and were informed about the possibility of withdrawing their consent at any time during the study. Recruitment ended after enrolling 30 patients.

Sample size

We determined the sample size of this feasibility study based on recommendations for pilot studies to include a minimum of 12 patients per study arm [62]. To account for an expected 25% dropout rate, we aimed to include 15 outpatients in each study arm, equal to a total sample size of 30.

Randomisation and masking

Patients who agreed to participate were randomly assigned to an intervention (IG) or a control group (CG). Group allocation was performed via independent computer-assisted software using a block randomisation procedure (Applied Clinical Research Centre at the Norwegian University of Science and Technology). After randomisation, outpatients were informed about their group allocation. All participants received treatment as usual (TAU). The statistician (ØS) was masked at the group level when performing analyses for the primary outcome and supervising the analysis plan with pre-defined outcomes.

Intervention and control group

Intervention group

The group-based psychoeducational programme was an in-person group educational programme, consisting of 10 weekly sessions (Table 1). All the participants in the IG received the intervention. We conducted three distinct groups, each comprising 9–11 study participants. Each session included a brief lecture from a recruited expert (a medical doctor, psychiatrist, psychologist, or nurse) on the session topic (20 min).

User representatives played a key role in suggesting and selecting topics for the lectures and their feedback contributed to the development of the presentation materials. These representatives, recruited from the ADHD User-led Organisation Norway (an organisation that

Table 1 Content of the peer co-facilitated educational programme

Topic and session focus	Lecturer
Introduction	Psychiatric nurse, user representative, and psychologist
Myths and facts about ADHD	
What is ADHD?	Psychiatrist or psychologist and representative from ADHD Norway
Inattention	Medical doctor or psychiatrist
Impulsivity	Medical doctor or psychiatrist
Hyperactivity	Medical doctor or psychiatrist
ADHD and comorbidity	Psychiatrist or psychologist, or experienced psychiatric nurse
Use of medications	Medical doctor or psychiatrist
Economy implications	Social worker and representative from ADHD User-led Organisation in Norway
Self-help groups and coping with daily life	Representative from ADHD User-led Organisation in Norway
Work and welfare	Representative from the Norwegian Labour and Welfare Administration (NAV) Representative from ADHD Norway
Summary and closing session	Nurse and user representative from ADHD User-led Organisation in Norway

Note NAV is the public Norwegian labour and welfare agency

provides support to people with ADHD), were invited to each planning meeting for this study. The selection of topics was based on the patients' needs, as identified with the assistance of user representatives and healthcare professionals.

Each session was structured with the lecture presented first, followed by a **discussion** section and session closing. There was no assigned homework. After this lecture, patients were free to discuss the topics and share their experiences (45 min). The **discussion** section was co-facilitated by the course leader and one user representative from the ADHD User-led Organisation (acting as peer co-facilitator). The peer co-facilitator contributed by posing relevant questions and initiating discussions between the participants. The main goal of the **discussion** section was for the outpatients to deepen their knowledge of the implications of ADHD diagnosis by sharing their experiences and information.

The educational programme was conducted in dedicated facilities geographically separated from the main clinic, ensuring that it was isolated from the general outpatient population. This arrangement provided a quiet, distraction-free environment, exclusively for the intervention group participants (IG). Access to this room was restricted to those who were part of the intervention group.

Control group

Outpatients in the CG received TAU consisting of medication treatment (if deemed necessary) and individual counselling or psychotherapy. Some patients also received assistance with housing, finances, support network or other important aspects of life, provided by a representative from the state social and welfare services (Norwegian Labour and Welfare Administration).

Data collection and outcome measures

Participants from the intervention group (IG) and the control group (CG) had data collected at three time points. For IG: baseline (T0) – an informational meeting prior to randomisation, where participants got information about the study, signed written informed consent, and filled in baseline questionnaires; pre-intervention (T1) – data collection took place immediately before the intervention; post-intervention (T2) – the time point after the last lecture of the educational programme. For CG: baseline (T0) – informational meeting prior to randomisation and collecting baseline questionnaires; intermediate points T1 and T2. The level of self-efficacy, the severity of ADHD symptoms and quality of life were measured at each time point for both groups.

Feasibility and acceptability outcomes

Feasibility was assessed for the following areas: (1) acceptance and consent to participate were determined a priori and defined as feasible if 50% of eligible outpatients accepted participation; (2) the adherence rate was predefined as the number of outpatients that attended all in-person sessions; and (3) the dropout rate was predefined as the ratio of the number of participants who dropped out of the intervention, with 25% considered an acceptable dropout rate.

Acceptability and overall patient satisfaction were assessed with the Client Satisfaction Questionnaire 4-items (CSQ-4). The CSQ-4 [63] was collected for both groups at T2. Data on this scale was collected for both the intervention group and the control group, and the results were compared. The CSQ-4 consists of four items, scored from one to four. One item is reverse-scored, and the remaining three are direct-scored. A sum of the scores between four and 16 indicates the degree of satisfaction with different aspects of the services provided. A higher total score means higher patient satisfaction. In this study, the Cronbach's alpha was 0.85.

Patient satisfaction with the given information was assessed via three items [29] measuring what participants think of the information they received: What do you think of the information you received (a) “about ADHD”, (b) “about the treatment options”, and (c) “about pharmacological treatment?”. Each item, assessed with the 5-point Likert-type scale, was rated from one (“not satisfied”) to five (“very satisfied”). Moreover, the “I don’t know” response option was added. The maximum total score for the survey was 15, which corresponds to the highest level of satisfaction with the information. In this study, the Cronbach’s alpha was 0.76.

Preliminary efficacy and patient-reported outcomes

Primary outcome

Self-efficacy

Self-efficacy was measured by the General Self-Efficacy Scale for patients with ADHD (GSE-6-ADHD). The GSE-6 consists of six items assessed on a 4-point Likert scale ranging from one (‘not at all true’) to four (‘exactly true’), with a maximum total score of 24, which corresponds to the highest level of self-efficacy [64]. The GSE-6 has been validated among adults with ADHD. The internal consistency in the validation study was 0.91 [64]. In this study, the Cronbach’s alpha was 0.83.

Secondary outcomes, ADHD symptoms and quality of life

Symptoms of ADHD were measured with the Hopkin’s Symptoms Checklist 9-items (SCL-9), ADHD specific subscale and the ADHD Self-Report Scale Full Edition (ASRS).

The SCL-9 consists of nine items scored from zero (“not at all”) to four (“very much”), with a maximum total score of 36, which indicates more pronounced symptoms of the disorder. This scale has been validated and tested in outpatient conditions [65]. Internal consistency in our study was 0.74 (Cronbach’s alpha). In another study the SCL-9 showed internal consistency equal 0.87 [66].

The ASRS was designed to measure symptoms in adults with ADHD [67]. The ASRS consists of 18 items and is divided into two parts: questions 1–9 reflect inattention symptoms (part A), and questions 10–18 reflect hyperactivity and impulsivity symptoms (part B). Each item was ranged from zero (“never”) to four (“very often”), with a maximum total score of 72, which indicates more pronounced symptoms. In the present study Cronbach’s alpha was .84. The internal consistency of the ASRS in other studies varied from 0.85 [68] to 0.97 [69].

Quality of life was measured using the Adult ADHD Quality of Life Scale (AAQoL) [70]. The AAQoL consists of 29 questions and four subscales. The Life Productivity subscale contains 11 items, the Psychological Health subscale contains six items, the Life Outlook subscale

contains seven items, and the Relationships subscale contains five items. Items are rated on a 5-point Likert scale. The total score is the sum of all scores reversed (except the Life Outlook subscale, which is not reversed) transformed (to a 100-point scale) and divided by the number of items. The AAQoL total score ranges from zero to 100. A higher score indicates a higher quality of life (53). In the present study, Cronbach’s alpha was 0.78. The internal consistency varied from 0.74 [71] to 0.93 [72].

Involving users’ perspectives

User representatives were actively involved in every phase of the study. During the planning and development stages of the psychoeducational programme, they were invited to identify pertinent outcomes for the RCT and choose topics for presentation within the programme. Their participation extended to the preparation of the study protocol, which included the selection of patient-reported outcomes.

One user representative played a multifaceted role, contributing to both the delivery of the intervention and the authorship of this article. During the intervention delivery, the representative led discussions, delivered portions of the lectures, and provided information about the services offered by user organisations for individuals with ADHD. They also offered support and responded to queries from study participants, maintaining this engagement even during breaks.

Statistical analyses

SPSS was used to conduct the statistical analyses [73]. An independent statistician performed the analyses regarding primary outcomes, following the planned analyses in the study protocol without deviations. Demographic data and data from the scales were described by mean (M), standard deviation (SD), and proportions. The differences between groups for continuous data were tested using the independent samples t -test or Mann-Whitney U test; the Chi-squared test of associations or Fisher’s exact test were used to identify differences between groups for categorical variables.

Feasibility indicators (acceptance rate, adherence rate and dropout rate) were described with absolute numbers and proportions (percentage frequencies). Satisfaction was calculated using two predefined criteria. We first calculated the total score of satisfaction, classifying it as high satisfaction if the score reached at least 75% of the maximum score (12 to 16). Secondly, we calculated high satisfaction, item per item. If a patient’s score for each single item was 3 or 4 (out of 1–4), the patient was classified as satisfied with the treatment; if a patient had a score of 1 or 2, they were considered not satisfied. Rates were compared in rates. Mean group differences

for patient satisfaction were also calculated using Mann-Whitney U tests (non-normally distributed data).

For the secondary outcomes, we performed an intention-to-treat analysis, with mean differences for outcomes on different time points calculated with SPSS, using linear mixed model analysis. The combination of timepoint and treatment group (with levels “Baseline”, “Pre-intervention”, “IG” and “CG”) was taken as fixed effect, while participants’ ID was taken as random effect. Next, we adjusted the model to account for the differences in employment status between the groups. Alpha levels were set to $p < 0.05$. To assess the effect size of the differences between the groups, Cohen’s d was calculated.

Results

Recruitment and feasibility

Of a total of 32 adults invited to participate, 30 outpatients were randomised. Table 2 details the demographic characteristics of the study participants by study group at baseline.

There were significantly more students in the IG compared with the CG. Beside this, there were no significant differences in baseline characteristics, demographic or questionnaire data between the groups.

Recruitment is presented in Fig. 1 (CONSORT flow diagram). Of the 32 invitation letters sent, two invitations were returned due to incorrect address information. This yields an overall acceptance rate of 93.8%.

Intervention delivery

The intervention was feasible to deliver. User representatives demonstrated full participation, attending all ten sessions. They took the lead in discussions and contributed to the delivery of several lectures (refer to Table 1 for details). Two out of 15 (13.3%) participants dropped out. The overall intervention attendance rate was high, with participants attending 82.3% of the sessions. Follow-up response rates in the intervention group were high. Out of 15 participants, 12 (80%) completed questionnaires at the T1 timepoint (pre-intervention). At the T2

Table 2 Demographic and baseline characteristics

Characteristics	Total sample, $n = 30$	IG, $n = 15$	CG, $n = 15$	p -value
Age				
M (SD)	30.20 (7.941)	31.33 (8.674)	29.07 (7.255)	0.444
Range	19–47	20–47	19–41	
Missing values	2 (6.7%)	1 (6.7%)	1 (6.7%)	
Sex				0.330
Male	5 (16.7%)	4 (26.7%)	1 (6.7%)	
Female	25 (83.3%)	11 (73.3%)	14 (93.3%)	
Marital status				0.557
Single	16 (53.3%)	8 (53.3%)	8 (53.3%)	
Married	4 (13.3%)	1 (6.7%)	3 (20%)	
Live together with someone	8 (26.7%)	4 (26.7%)	4 (26.7%)	
Divorced	2 (6.7%)	2 (13.3%)	0	
Educational level				0.583
Primary/secondary school	7 (23.3%)	5 (33.3%)	2 (13.3%)	
Post-secondary school	18 (60.0%)	8 (53.3%)	10 (66.7%)	
High school/ university	5 (16.7%)	2 (13.3%)	3 (20.0%)	
Employment status				0.030
Student	8 (26.7%)	7 (46.7%)	1 (6.7%)	
Employed	9 (30.0%)	3 (20%)	6 (40%)	
Employed partly (50%)	4 (13.3%)	1 (6.7%)	3 (20.0%)	
Disabled	2 (6.7%)	2 (13.3%)	0	
Unemployed	5 (16.7%)	1 (6.7%)	4 (26.7%)	
Other	1 (3.3%)	0	1 (6.7%)	
Missing values	1 (3.3%)	1 (6.7%)	0	
ADHD medicine				0.598
Yes	22 (73.3%)	12 (80%)	10 (66.7%)	
No	8 (26.7%)	3 (20%)	5 (33.3%)	
Individual counselling/psychotherapy				1.00
Yes	16 (53.3%)	8 (53.3%)	8 (53.3%)	
No	14 (46.7%)	7 (46.7%)	7 (46.7%)	
Comorbid diagnoses				1.00
	13 (43.3%)	7 (46.7%)	6 (40%)	

Note ADHD=Attention deficit/hyperactivity disorder, M =mean, n =number of participants, SD =Standard Deviation

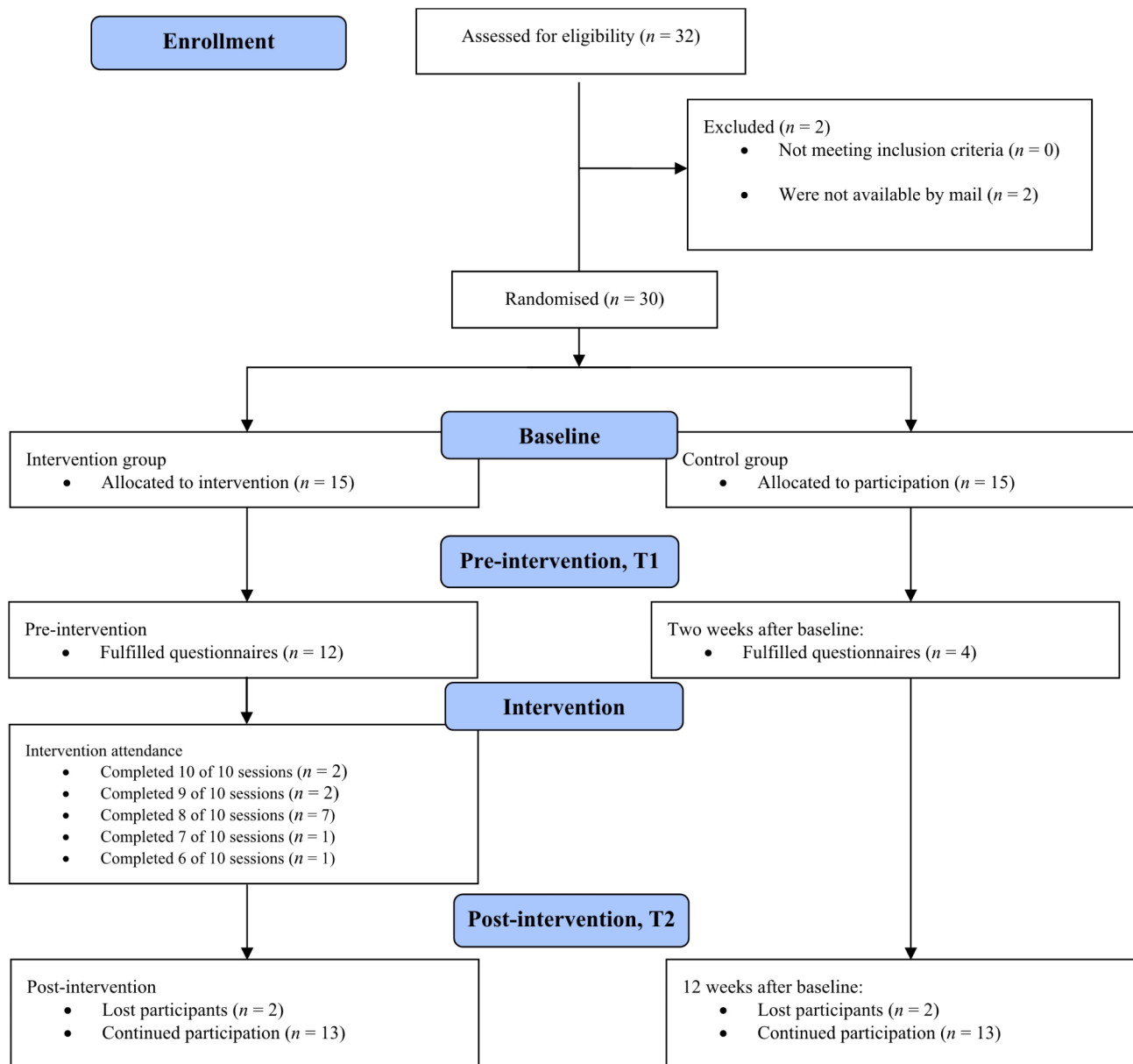


Fig. 1 Flow of participants through the self-management group-based educational interventions study

time point, 26 (86.6%) participants completed the questionnaires: 13 in the IG and 13 in the CG.

Acceptability and satisfaction

Acceptability and satisfaction with the programme were examined with the CSQ-4 in T2. In total, 12 participants (80%) answered CSQ-4 in the IG and 11 (73.3%) in the CG. The between-group analyses revealed that the IG reported significantly greater satisfaction (mean CSQ-4=12.83, SD=1.90) than the CG (mean CSQ-4=11.89, SD=2.34), $p=.027$.

At T2, a significantly larger proportion of the outpatients receiving the psychoeducational intervention were classified as very satisfied: 11 out of 12 participants

scored the maximum score, equal to 12 or more (91.6%), whereas 5 of 11 outpatients in the CG (45.5%), $p=0.027$. A more detailed analysis of the item level is presented in Table 3.

Satisfaction with the information

As shown in Table 4, IG participants reported higher satisfaction with the information they received, as measured by the 3-item survey. Linear mixed model analyses showed statistically significant differences between groups at the T2 timepoint $p=0.018$, 95% CI [0.472, 4.562]. Moreover, a large effect size with a Cohen's d equal to 1.317 suggests a strong and significant difference between groups.

Table 3 The proportion of participants who scored 3 or 4 on the CSQ-4 items

Items	IG (n = 12)	CG (n = 11)	p-value
CSQ-4 item 1 (How well has our programme met your needs)	9 (75%)	7 (63.6%)	0.667
CSQ-4 item 2 (Did the services you received help you handle problems?)	11 (91.6%)	6 (54.5%)	0.069
CSQ-4 item 3 (Would you return to our program if you needed help again)	11 (91.6%)	10 (90.9%)	1.00
CSQ-4 item 4 (Would you return to our program if you needed help again)	11 (91.6%)	7 (63.6%)	0.155

Note CSQ=Client Satisfaction Questionnaire

Table 4 Between-group comparisons of primary and secondary outcomes

Outcomes	Model-based Mean at T0		Model-based Mean at T2		Model-based difference between groups at T2					
	Baseline	Pre-intervention	IG	CG	Diff	95% CI	p-value	p-value*	p-value for F test	Cohen's d
GSE-6, total score	15.533	16.571	17.408	15.959	1.449	-.57, 2.954	.059	.043	.013	.461
Satisfaction with the information,3 item, total score	7.258	7.260	10.279	7.763	2.517	.472, 4.562	.018	.028	.027	1.317
SCL-9, total score	18.433	15.556	17.161	17.634	-.473	-4.496, 3.550	.814	.633	.123	.161
ASRS, total score	46.933	45.215	45.395	45.484	-.089	-4.600, 4.422	.968	.758	.442	.066
ASRS, inattention subscale	25.400	23.439	23.118	24.489	-1.37	-4.568, 1.826	.392	.330	.149	.247
ASRS, hyperactivity subscale	21.533	21.613	22.322	20.960	1.362	-1.421, 4.145	.329	.528	.926	.152
AAQoL, total score	49.51	51.884	48.933	45.699	3.235	-4.749, 11.218	.419	.270	.237	.335
AAQoL, life productivity subscale	52.417	53.139	47.804	46.106	1.698	-9.743, 13.139	.767	.488	.341	.193
AAQoL, psychological health subscale	43.611	50.677	50.038	40.611	9.427	-1.956, 20.810	.102	.114	.148	.557
AAQoL relationship subscale	51.000	59.158	59.231	46.855	12.38	2.348, 22.404	.017	.007	.012	.781
AAQoL, life outlook subscale	49.286	47.945	49.121	47.302	1.819	-4.954, 8.593	.591	.616	.847	.123

Note: AAQoL=Adult ADHD Quality of Life scale, ASRS=Adult ADHD Self-Reported Scale, GSE-6=General Self-Efficacy scale, SCL-9=Symptom-Checklist scale

* Linear mixed model, adjusted for employment status

Preliminary effects

Preliminary results of the intervention are presented in Table 4. The initial statistical analysis did not show a statistically significant difference between groups in GSE-6 outcome (p -value=0.059). However, after adjusting the linear mixed model for the employment status with the variable “employment status” as a fixed effect, the results showed statistically significant difference between the groups regarding levels of self-efficacy. The mean difference between the groups at T2 was 1.635 (p =.043, 95% CI [0.054, 3.216]). The linear mixed model revealed a significant improvement in the “relationship” subscale of the AAQoL for the IG versus the CG (Mean difference=12.376, p =.017, 95% CI [2.348, 22.404]). There were no significant differences between groups on the other patient-reported outcomes.

Discussion

While psychoeducational group interventions have the potential to reach many outpatients, and co-facilitating groups can have a positive impact for adults newly

diagnosed with ADHD, there is a need for studies on the feasibility and potential benefits of such interventions. Based on our preliminary results, psychoeducational group programmes co-facilitated with user representatives could be both feasible and acceptable to patients and may improve patient satisfaction.

The feasibility of the programme was demonstrated in our study. The majority of the outpatients were willing to participate, with the acceptance rate in our study higher than in other peer co-facilitated studies [31, 32, 39, 74, 75]. No patients withdrew informed consent during the intervention. Moreover, 86.6% of the participants completed the intervention, comparable to previous studies [45, 46, 74, 76]. In the Hirvikoski et al., 2015 [45] study, which evaluated the “PEGASUS” psychoeducational programme, 84.3% of participants with ADHD completed the intervention. In a later study by Hirvikoski et al. (2017), 95.8% (46 out of 48) participants completed the same programme [46].

A relatively low percentage of participants dropped out in our study compared to other peer co-facilitated

interventions [32, 39, 42, 74], where dropout rates were between 22% and 12.6%. Another psychoeducational programme for adults with ADHD showed comparable dropout rates [47, 76]. For instance, Hoxhaj et al. (2018) [76] compared a psychoeducational programme with a mindfulness training programme, and the dropout rate in the total sample was 7%, while in the psychoeducation group the dropout rate was 10%. Vidal et al. (2013) [47] also reported 93.75% intervention completion. The minimal dropout rate in our study may be attributed to the motivation of the patients and the active involvement of user representatives in the intervention's development and delivery. This finding is consistent with prior research [77], which suggests that user involvement not only leads to greater study adherence, but also results in greater satisfaction of patients' needs [78], better outcomes [55], and increased patient activation [79].

The attendance rate in our study was high, supporting the feasibility and acceptability of the intervention. Notably, only two out of 15 patients attended fewer than eight out of 10 sessions. Moreover, all the participants who completed the intervention attended more than half of the sessions. These findings are comparable to previous studies on psychoeducational programmes for adults with ADHD, where attendance rates were 84.3% [80] and 87% [81]. However, the attendance rate in our study was higher than in previous peer co-facilitated interventions. For instance, Druss et al. (2018) reported that 70% of participants attended at least four of six sessions [74], Goldberg et al. (2013) reported that 59% of participants attended five of 15 sessions [42] and Bartels et al., reported that all of the participants attended five or more out of nine sessions [82]. The high acceptance rate among newly diagnosed patients may indicate that initiating psychoeducational interventions early, when interest in understanding the disorder is at its peak, can foster greater engagement. This preliminary result could be a crucial factor to consider when designing future interventions for similar populations. Moreover, the exclusion of individuals who had previously participated in group therapy may have resulted in a selection of more engaged study participants. This suggests that interventions of this nature could benefit from targeting individuals who are newcomers to such therapeutic settings, potentially leading to increased participation. Taken together, these findings suggest that peer co-facilitated interventions in community settings could serve as a model for future interventions, emphasising the importance of collaboration with user representatives in the development of effective programmes.

Overall, the outpatients in the intervention group were highly satisfied with the programme. Compared to the CG, the IG also showed significantly higher satisfaction with the information, indicating that the patients

perceived the programme in a positive way. In previous studies related to psychoeducation for ADHD, only one study [80] reported data on patient satisfaction, and participants ($n=41$) were "willing to participate in a similar programme in the future". In addition, a study based on peer co-facilitated intervention also reported high satisfaction with the intervention [83]. These preliminary findings suggest that outpatients, regardless of whether they were in a psychoeducational group co-facilitated by users or by healthcare professionals, reported a positive experience with psychoeducation. However, our findings should be considered preliminary as few studies have investigated patients' satisfaction with psychoeducational programmes co-facilitated in collaboration with user representatives. Furthermore, while we used a validated scale to measure general satisfaction, the evaluation of satisfaction with the information was performed with a 3-item scale that has not been psychometrically validated in this population.

Regarding self-efficacy, the linear mixed model analysis, without adjusting for employment status, did not reveal a statistically significant difference in GSE-6 total scores between groups. There may be several reasons explaining why significant differences were not observed in this case. Firstly, the limited sample size of 13 participants who completed the GSE-6 at T2 may have left the study underpowered to detect significant differences. Secondly, our study was not specifically designed to detect effects on patient-reported outcomes, including self-efficacy. However, when adjusting the model for employment status, the results indicated a significant improvement in self-efficacy. This finding contrasts with evidence from a study on individuals with different mental disorders that found no connection between high levels of self-efficacy and maintaining employment [84]. However, given the significant role of employment status in influencing self-efficacy, future research is needed in the ADHD population. Studies could investigate how different aspects of employment (e.g., job security, job satisfaction) impact self-efficacy and related outcomes.

Regarding other patient-reported outcomes, the results of our study indicated a significant improvement in quality of life, particularly in the context of relationships. This improvement could be linked to the positive influence experienced by individuals diagnosed with ADHD when they interact with other participants and access necessary information through these educational programs. Such interactions and information can positively impact their relationships with immediate family members. However, these findings should be interpreted with caution, as our study did not indicate improvements in other aspects of quality of life. Our findings related to quality of life contrast with previous studies on group programmes for ADHD patients [85] or internet-delivered programmes

[86] which reported an overall improvement in quality of life scores post-intervention. It is, however, important to note that the mean total scores at baseline in these studies were lower than ours (43.4 and 47.8 vs. 49.5, as measured using AAQoL). This lower baseline quality of life score provides a larger potential for improvement during the intervention. Additionally, our limited sample size may have restricted our ability to detect significant differences. However, regarding psychoeducational group interventions for adults diagnosed with ADHD, the current body of evidence from clinical and feasibility studies remains inconclusive concerning quality of life. For example, a feasibility study conducted in 2015 [45] demonstrated improvement in relationship quality over time. In contrast, RCTs carried out by Vidal et al. (2013) [47] and Hirvikoski et al. (2017) [46] failed to identify significant improvement. Given the relative infancy of evidence regarding psychoeducational group programmes for adults with ADHD, it becomes evident that further research, with a greater number of outpatients, is required to further investigate the impact of psychoeducational programmes on participants' quality of life.

Strengths and limitations

The present study has several strengths. First, this is the first intervention for adults with ADHD that has been planned and conducted in close collaboration with user representatives. In addition to a proof-of-concept RCT-design, the study was conducted in a clinical setting with high recruitment rates. The study included adults newly diagnosed with ADHD and developed a psychoeducational intervention in a context where evidence for psychoeducation group programmes remains limited.

With these strengths in mind, and based on the results of the intervention's feasibility, future work might further explore the potential of co-facilitating psychoeducational group interventions developed in collaboration with patient organisations. This feasibility study also documented user involvement in research. However, the scarce evidence in this field regarding psychoeducational group interventions for newly diagnosed ADHD adults underscores the need for further research.

Despite these strengths, the study also has some limitations to note. As discussed, the small sample size limited our findings, and generalisability is limited as the study was conducted in one clinic only. Moreover, despite the study being an RCT, the randomisation led to an unexpected imbalance, resulting in a larger student population in the intervention group. This discrepancy was an unintended consequence of the randomisation process. It is, however, important to note that the mean baseline scores between the groups showed no significant differences. Additionally, our sample was predominantly female, comprising 83.3% of the total study sample. In comparison,

other RCTs focusing on psychoeducation for adults with ADHD reported female representation ranging from 33.3 to 79.9% [43]. This gender disparity, however, mirrors the typical demographic trends observed within the Norwegian population [87]. Furthermore, although the statistical analyses were conducted by a masked independent statistician to ensure objectivity, it was impossible to mask participants due to intervention's design. This lack of blinding may introduce bias, as participants were aware of the intervention they were receiving.

We did not collect baseline data on patient satisfaction with the treatment, which limits our ability to measure changes in satisfaction levels over time. Establishing a baseline is crucial for understanding the true impact of the intervention on patient satisfaction. Future research should incorporate designs that include multiple measurement timepoints to better capture the dynamic nature of patient satisfaction and the long-term impact of educational interventions. This approach would allow for a more comprehensive understanding of how these interventions influence patient satisfaction over time and their potential contribution to service improvements in mental health settings. To address these limitations, we recommend that further studies be conducted with baseline assessments of follow-up periods and the inclusion of baseline satisfaction data. Such studies would provide more robust evidence on the long-term benefits of educational interventions and offer valuable insights into how these interventions can enhance patient satisfaction and overall service quality in mental health care.

Conclusions

Our proof-of-concept randomised controlled trial provides preliminary evidence supporting the feasibility and acceptability of the user co-facilitated psychoeducational programme for patients newly diagnosed with ADHD in an outpatient setting. While preliminary findings demonstrate promise in enhancing patient-reported outcomes, a more robust study with a larger sample size is essential to rigorously evaluate the intervention's effectiveness.

Abbreviations

AAQoL	Adult ADHD Quality of Life scale
ADHD	Attention-deficit/hyperactivity disorder
ASRS	Adult ADHD Self-Reported Scale
CG	Control group
CI	Confidence interval
CONSORT	Consolidated Standards of Reporting Trials
CSQ-4	Client Satisfaction Questionnaire 4 items
CSQ-8	Client Satisfaction Questionnaire 8 items
GSE-6	General Self Efficacy 6 abridged version for ADHD
IG	Intervention group
M	Mean
M diff	Mean difference
RCT	Randomised control trial
SCL-9	Hopkin's Symptom Checklist 9-item scale
SD	Standard deviation
TAU	Treatment as usual

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Author contributions

TS: Methodology, data curation, analysis, writing – original draft, review & editing. M.L.L.-C.: Conceptualization, data collection, co-delivering, writing - review & editing, supervision, funding acquisition. HH: Conceptualization, methodology, data collection, Co-delivering the intervention, and review & editing. AH: Supervision, review & editing. ØS: Statistical analysis, formal analysis, review & editing. S-GS: Co-delivering the intervention, data collection, review & editing. JV: Conceptualization, co-delivering the intervention, data curation, methodology, review & editing. TT: Conceptualization, co-delivering the intervention, data collection, investigation, project administration, funding acquisition, writing, review & editing. All the authors reviewed and confirmed the final version of the manuscript.

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Data availability

The datasets used during the current study can, on reasonable request, be available from the corresponding author.

Declarations

Ethics approval and consent to participate

The research trial was conducted according to the Helsinki Declaration (1964) and approved by the Regional Committee for Medical Research Ethics (REC 2017/r20221885). The study protocol was registered at <http://www.clinicaltrials.gov/> 09.11.2017 (Protocol Record NCT03337425). Written informed consent was obtained prior to inclusion and randomisation from all outpatients included in the study.

Competing interests

The authors declare no competing interests.

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