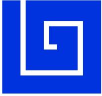

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COMBINATIONS OF PSYCHIATRIC REHABILITATION INTERVENTIONS FOR SEVERE MENTAL ILLNESSES: A SCOPING REVIEW

ABSTRACT

Objectives: *The aim of this scoping review was to collate studies on the combinations of psychiatric rehabilitation interventions in severe mental illness (SMI).* ***Materials and methods:*** *The scoping review was conducted in accordance with the JBI methodology for scoping reviews and included also knowledge user consultation. Three-step search strategy was utilized, and searches conducted in Pubmed, Scopus and PsychArticles in February 2023. Studies were included that utilized a combination of at least three psychiatric rehabilitation methods for individuals with SMI, provided a description of the intervention, and reported on the effectiveness results. A quality appraisal of the included studies was conducted, followed by a narrative synthesis of the results and a knowledge user consultation on the review's findings.* ***Results:*** *Finally, 27 studies were found considering combinations of psychiatric rehabilitation meeting the inclusion criteria published between 2004 and 2022. Most studies were quantitative and eight used a RCT design. Most of the interventions were conducted in community mental services and a quarter in inpatient settings. Combinations of psychiatric rehabilitation were effective in decreasing psychiatric symptoms and increasing functioning, as well as quality of life. The quality of the included studies was mediocre at best. Knowledge users raised issues on varying use of psychiatric rehabilitation in Finland, the settings of the services and collaborative relationship between service user and provider.* ***Conclusions****: Combinations of psychiatric rehabilitation interventions could be effective on different outcomes (e.g. decreasing psychiatric symptoms, improving functioning and quality of life). More research is needed in combinations of psychiatric rehabilitation interventions for persons with SMI.*

KEYWORDS: PSYCHIATRIC REHABILITATION, SEVERE MENTAL ILLNESS, SCOPING REVIEW, KNOWLEDGE USER CONSULTATION, QUALITY APPRAISAL

INTRODUCTION

Severe mental illness (SMI) can be defined by either solely the diagnosis or more widely by the burden that the illness causes on a person's functioning (e.g. the ability to live independently or to work) as well as the duration or chronicity of the disorder [1]. Commonly disorders like schizophrenia, other major psychosis and bipolar disorder are labelled as SMI, and some definitions include also severe personality disorders and affective disorders to SMI [1]. Estimates on persons in recovery from SMI depend largely on diagnosis and outcomes considered and are estimated to vary between 14–73% [2–7].

Psychiatric rehabilitation encourages individuals to use their skills and resources of the environment to improve their functioning and quality of life and to cope with the symptoms of mental disorders [8]. Psychiatric rehabilitation methods should be based on scientific evidence [9]. Methods of psychiatric rehabilitation include, for example, cognitive behavioural therapy [10,11], cognitive remediation [12,13], family interventions [11,14] and Individual Placement and Support [15,16]. It is suggested that best effects are attained when merging psychiatric rehabilitation methods into meaningful combinations [17,18].

Recovery from SMI, for example schizophrenia, has not improved in the past decades [3,4]. Research on the effectiveness of care and rehabilitation for individuals with SMI is needed. According to our knowledge, there has not been a review conducted focusing on combinations of psychiatric rehabilitation interventions for persons with SMI. A Cochrane review of first-episode psychosis interventions (that also combine diverse methods) performed in 2011 concluded that there is emerging evidence of the effectiveness of specialized early intervention services [19]. There is also a more recent Cochrane review on early intervention services with an extended intervention period [20]. In conclusion, the evidence base of first-episode psychosis interventions is much more comprehensive than that of combinations of psychiatric rehabilitation interventions for SMI. Scoping reviews are recommended for use when a body of literature is complex, heterogeneous and not amenable to a more precise systematic review. A scoping review can disseminate research findings, gaps in the literature as well as make recommendations for future research [21].

Our aim was to collate studies on combinations of psychiatric rehabilitation interventions in severe mental disorders. The research questions were the following:

a. What combinations of psychiatric rehabilitation have been studied among individuals with SMI?
b. What is the effectiveness in general of combinations of psychiatric rehabilitation for individuals with SMI regarding different outcomes?
c. What is the quality of the studies of combinations of psychiatric rehabilitation for individuals with SMI?

METHODS

The scoping review was conducted in accordance with the Joanna Briggs Institute (JBI) methodology for scoping reviews [21]. Knowledge user consultation [22] was also used. In reporting of the study, PRISMA guidelines for Scoping Reviews was followed [23].

SEARCH STRATEGY

The search strategy aimed to identify published and unpublished studies and three-step search strategy was utilized. Initially, exploratory searches were conducted to identify relevant keywords and after that the search strategy was drafted with the aid of an information specialist with experience in health-related subjects. Data were collected from electronic databases (Pubmed, Scopus and PsychArticles) on Feb 23, 2023. Free word search and MESH terms were used during the search. The search strategy and search terms are presented in *Table 1*. The reference list of all included studies was screened for additional references.

Table 1. Search strategy and search terms for a scoping review on combinations of psychiatric rehabilitation for individuals with SMI

Database	Search terms	Number of references
Pubmed	((((("Mood Disorders"[Mesh]) OR "Personality Disorders"[Mesh]) OR "Schizophrenia Spectrum and Other Psychotic Disorders"[Mesh]) OR ("serious mental dis*"[Text Word] OR "serious mental illness*"[Text Word] OR "severe mental dis*"[Text Word] OR "severe mental illness*"[Text Word])) AND (("Mental Health Recovery"[Mesh]) OR (recover*[Text Word]))) AND (("Rehabilitation"[Mesh]) OR (rehabilitat*[Text Word]))	1 806
PsychArticles	(TITLE-ABS-KEY ("serious mental dis*" OR "serious mental illness*" OR "severe mental dis*" OR "severe mental illness*" OR psychosis OR "psychotic disorder*" OR schizophrenia OR "schizoaffective disorder*" OR "bipolar disorder*") AND TITLE-ABS-KEY (recover*) AND TITLE-ABS-KEY (rehabilitat*)	306
Scopus	(TITLE-ABS-KEY ("serious mental dis*" OR "serious mental illness*" OR "severe mental dis*" OR "severe mental illness*" OR psychosis OR "psychotic disorder*" OR schizophrenia OR "schizoaffective disorder*" OR "bipolar disorder*") AND TITLE-ABS-KEY (recover*) AND TITLE-ABS-KEY (rehabilitat*))	1 194

INCLUSION AND EXCLUSION CRITERIA

PICO is an acronym for Population, Intervention, Comparison and Outcome used for describing inclusion and exclusion criteria in studies [24] . For inclusion in the review, studies were required to meet the following criteria: a) participants with SMI (including psychotic and mood disorders) and b) participants ≥15 years and not defined as elderly. Studies were excluded if: a) participants had primarily (>50% of the sample) first-episode psychosis (due to comprehensive systematic reviews conducted of early intervention services [19,20]), a substance use disorder, a somatic illness with co-occurring mental health disorders, b) participants were veterans, relatives or caregivers of persons with a SMI or social and healthcare personnel, c) participants were under 15 years or defined as elderly.

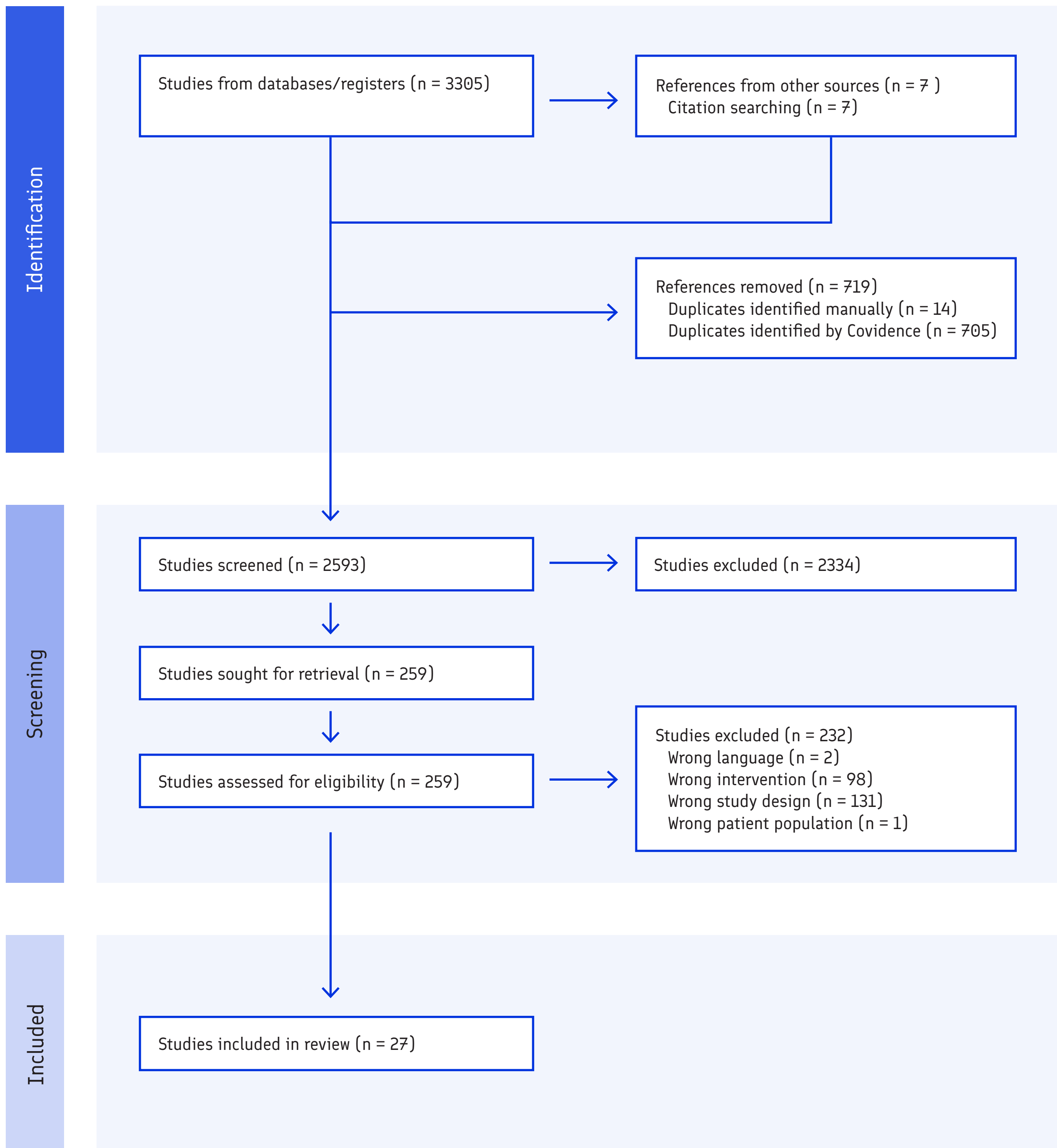
Considering intervention and outcome, original articles were included in the review if they included: a) a description of the combination of ≥3 psychiatric rehabilitation interventions (in addition to combination of psychiatric rehabilitation interventions, other treatments such as medication could be included), b) a comparison group was not required, but could be included, and c) any outcomes on the effect of the combination of psychiatric rehabilitation interventions. Studies with a variety of outcomes were included to obtain a comprehensive view of the effects of combinations of psychiatric interventions (e.g. psychiatric symptoms, quality of life, functioning and goal attainment). Studies were excluded if an article did not report description of the intervention.

This scoping review considered original articles, written in English, experimental and quasi-experimental study designs (randomized controlled trials (RCT), non-randomized controlled trials, before and after studies and interrupted time-series studies and analytical observational studies, e.g. prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies) and qualitative studies. No sample size limitation was set. Studies were excluded if they: a) did not present original data (for example review article), b) were case studies, and c) were in any other language than English.

STUDY SELECTION

Search results were imported, and screening of the review data was done in Covidence. Covidence is a web-based collaboration software platform that streamlines the production of systematic and other literature reviews [25]. Identified documents were screened for eligibility through title and abstract review by one researcher (JT). Full-text screening against the inclusion and exclusion criteria was done by two researchers (JT, KH) independently. In case of a disagreement, consensus was acquired with consultation from other researchers. The results of the search and study inclusion process are reported and presented in PRISMA flow diagram [23] in *Figure 1*.

Figure 1. Scoping review of combinations of psychiatric rehabilitation interventions for SMI



DATA EXTRACTION AND SYNTHESIS

Data extracted from papers included in the scoping review was done by one independent reviewer (JT) with the JBI data charting approach [21] modified for the purposes of this study. Extracted data included: a) authors, b) year of publication, c) country of origin, d) study design and purpose, e) population and sample size, f) description of the intervention, g) outcomes, and h) key findings. For sample size, the length of rehabilitation (if a range was reported, a mean was calculated) and follow-up time, the range and mean were calculated. For country of origin, study design and setting, and diagnosis of participants, frequencies with proportions were calculated. The results are presented through a narrative synthesis, supplemented by tables that correspond to the objectives of this scoping review.

For the purpose of describing the interventions in the original studies included in the review, one independent reviewer (JT) extracted the psychiatric rehabilitation interventions used in the combination interventions. After extraction the reviewer did a simple literary search in Pubmed database on the different interventions found. As search terms, the name of the intervention and terms "severe mental illness" or "severe mental disorder" were used. Systematic reviews and original research articles were included. Based on the publications found, psychiatric rehabilitation interventions included in the combination interventions were charted based on found evidence: a) at least one systematic review of methodical high quality with positive evidence of effect, b) at least one scientific study of methodical high quality with positive evidence, c) one systematic review of methodical high quality with no evidence of effect, and d) no scientific evidence.

QUALITY ASSESSMENT OF THE STUDIES

The quality assessment of the studies was done with the JBI Critical Appraisal Tools by two authors independently (JT, KH). Conflicts were discussed and settled by the two reviewers and with consultation from other authors. Due to the nature of a scoping review different JBI critical appraisal tools were used: Analytical Cross-Sectional studies (nine studies) [26], Randomized Controlled Trials (seven studies) [27], Quasi-Experimental Studies (five studies) [28], Cohort studies (five studies) [26] and Qualitative Research (one study) [29]. Total items in the checklists varied from eight to 13 and items are rated ´yes`, ´no` and ´not applicable`. Study quality was assessed as good when 75–100%, fair when 25–75% and poor when 0–25% of the items gained positive response. The quality of the study did not affect inclusion in the review.

KNOWLEDGE USER CONSULTATION

Preliminary findings of the scoping review were shared with five knowledge users to gain knowledge if and in what ways they found our findings relevant in the field of psychiatric rehabilitation. Knowledge users were experts by experience (n=2), administrators of mental health services (n=2) and a mental health professional (n=1). Knowledge users were asked for experiences about the feasibility and usefulness of the interventions and/or their combinations. They were also asked to share their thoughts about the future of psychiatric rehabilitation interventions and their combinations in Finland.

ETHICAL APPROVAL

Patient records or data were not used in this study as it was a literary review. Knowledge users consulted on results of the scoping review and gave their written consent to participate in the consultation. The need for ethical review was waived in guidance of the Northern Ostrobothnia Wellbeing District (POHDE) ethical committee. The Finnish legislation on medical research [30] states that there is no need for an ethical approval when criterion for medical research is not fulfilled. This study was done in accordance with Declaration of Helsinki [31] and Finnish guidance on responsible research [32].

RESULTS

SEARCH RESULTS AND STUDY SELECTION

The initial search yielded 3 305 citations and 2 600 articles were retained after duplicates. After title and abstract screening, 259 articles were assessed for eligibility and 20 studies included in the review. With a manual search, seven studies were identified (n=27). The reasons for the exclusion of studies that did not meet the inclusion criteria are reported in *Figure 1*.

DESCRIPTION OF THE INCLUDED STUDIES

Studies were published between 2004 and 2022. Most studies were quantitative (n=25, 92.6%), and one (3.7%) was qualitative and one (3.7%) mixed methods study.

Retrospective study design was used in six (22.2%) studies. There were five (18.5%) Cross-Sectional Analytical studies and 11 (40.7%) follow-up studies in which follow-up time varied from 10.5 to 60 months (mean 28 months). Most of the studies had a RCT design (n=8, 29.6%) or a cohort study design (n=7, 25.9%). Most studies were done in Europe (n=21, 77.7%), three (11.1%) in Australia, and one (3.7%) of each in the United States of America, Asia and a global multicentre study.

In included studies, the range of participants varied from 47 to 1762 (mean 193) and the total amount of participants was 5 150. Diagnosis of the participants in the included studies was in order of magnitude: psychosis disorder (n=13, 48.1% of studies), SMI (n=12, 44.4%), mood or anxiety disorder (n=1, 3.7%) and psychosis disorder or mood disorders (n=1, 3.7%). There were no studies that investigated combinations of psychiatric rehabilitation for participants with solely personality disorders. For more details see *Table 2*. Summary of studies included in the scoping review.

Table 2. Summary of studies (n=27) included in the review categorized according to publication year, matching intervention and/or overlapping sample

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Kavanagh & Lavelle 2008 (59) *Ireland*	Retrospective, Cross-sectional analytical study. Described the characteristics of patient groups residing in inpatient rehabilitation services and the impact of a rehabilitation and recovery services on their outcomes	Mental health service users in a psychiatric rehabilitation service (n=50)	Intervention was based on recovery orientation and goal attainment. Every participant had an individual plan to gain skills and move on to less supported accommodation that was encouraged. Methods of the intervention: medication, behavioural interventions, psychoeducation, family interventions, vocational rehabilitation and medical adherence therapy. Setting psychiatric hospital 24h/day Mean length of intervention 72 months	Assessment of needs CAN (n=30) High-risk behaviour, prior residential status, length of admission to unit	During the intervention 25 participants moved on: to another rehabilitation unit 10 (20%), less supported accommodation 7 (28%), independent living 6 (24%), substance use rehabilitation 1 (4%) and residential services 1 (4%)	JBI Critical Appraisal Tool for Cohort Studies, Positive response 3/8 (38%), Study quality fair

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Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Kavanagh, Nkire & Lavelle 2009 (58) *Ireland* Overlapping sample with (59)	Retrospective Cohort study (5-year follow-up). Described the characteristics and progress of a patient group in inpatient rehabilitation services	Mental health service users in a psychiatric rehabilitation service between 2001–2006 (n=50)	Intervention was based on recovery orientation and goal attainment. Every participant had an individual plan to gain skills and move on to less supported accommodation that was encouraged. Methods of the intervention: medication, behavioural interventions, psychoeducation, family interventions, vocational rehabilitation and medical adherence therapy. Setting psychiatric hospital 24h/day. Mean length of intervention 77 months	Assessment of needs CAN (n=29) Risk behaviour SPRS (n=29) Prior and after residential status, length of admission to unit, rehabilitation interventions at unit	From baseline to follow-up less participants were in independent living (baseline n=5, 10%; follow-up n=1, 2%) and more were in residential accommodation (baseline n=15, 30%; follow-up n=18, 36%). The number of participants in inpatient treatment had remained almost the same (baseline n=20, 60%; follow-up n=29, 58%). Among the participants 36% participated in vocational rehabilitation	JBI Critical Appraisal Tool for Cohort Studies, Positive response 3/8 (38%), Study quality fair
Cavallaro et al. 2009 (49) *Italy*	Randomized Controlled Trial. Evaluated the ability of intensive Cognitive Remediation (CR) to enhance the effects of a standard rehabilitation treatment programme	Persons with schizophrenia (DSM-IV criteria). In clinical balance, for example, no changes in medication in the prior 6 months (n=86). Exclusion criteria: substance use, mood or personality disorder, developmental disability or neurological disorder. Participants participated in either domain-specific CR and psychiatric rehabilitation or non-domain-specific CR and psychiatric rehabilitation	Methods of the intervention: psychoeducation, verbal communication, social skill training and problem-solving, parts of psychological therapy and a rehabilitation programme for social skills in accommodation, work and leisure. Frequency 3h*3 times a week. Additionally, Computer-aided CR 1h*3 times a week for 3 months. Mean length of intervention 15 months	Psychiatric symptoms PANSS Neurocognitive functioning WCST, BACS, CPT Quality of life QLS	There was no statistically significant change in psychiatric symptoms before and after or between groups. Participants who received domain-specific CR compared to participants who received non-domain-specific CR had after the intervention statistically significantly better performance in cognitive flexibility (*p=0.002–0.001*) and had better quality of life (*p=0.02*)	JBI Critical Appraisal Tool for Randomized Controlled Trials, Positive response 9/13 (69%), Study quality fair

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Poletti et al. 2010 (51) *Italy* Partly overlapping sample with (49)	Follow-up study (1-year follow-up). Study aimed to establish if the results achieved through an intensive deficit-specific neurocognitive treatment of three months duration were maintained over time	Persons with schizophrenia (DSM-IV criteria). In clinical balance, for example, no changes in medication in the prior 6 months (n=100). Exclusion criteria: substance use, mood or personality disorder, developmental disability or neurological disorder. Participants participated in either domain-specific CR and psychiatric rehabilitation or non-domain-specific CR and psychiatric rehabilitation	Methods of the intervention: psychoeducation, verbal communication, social skill training and problem-solving, parts of psychological therapy and a rehabilitation programme for social skills in accommodation, work and leisure. Frequency 3h*3 times a week. Additionally, Computer-aided CR 1h*3 times a week for 3 months. Mean length of intervention 15 months	Neurocognitive functioning WCST, BACS, CPT Quality of life QLS	Participants who received domain-specific CR compared to participants who received non-domain-specific CR had statistically significantly better performance in cognitive sub-domains of verbal memory (*p*=*0.03*), working memory (*p*<*0.001*), psychomotor coordination (*p*<*0.001*) and executive functioning (*p*=*0.002*) at follow-up. Participants who received domain-specific CR compared to participants who received non-domain-specific CR had statistically significantly better quality of life (*p*=*0.001*), self-directiveness (*p*=*0.015*) and relationships (*p*<*0.001*)	JBI Critical Appraisal Tool for Randomized Controlled Trials, Positive response 8/13 (62%), Study quality fair
Painter 2012 (45) *United States of America*	Longitudinal time-series study. The purpose of the study was to report findings of a longitudinal time-series study of the community mental health system	Participants of Service package 3 between 9/2008–8/2009. Included participants over 18 years, with diagnosis of schizophrenia, schizoaffective, bipolar disorder or psychotic depression. Participants had moderate to severe problems in functioning and need for intensive support and service (n=382)	Texas Disease Management Model includes four service packages. Service package 3 is designed for persons with psychotic disorders with need for intensive support and services. Methods included in the intervention: computer-aided medication management, case management, including training in activities of daily living and patient and family education	Psychiatric symptoms PSRS, BNSA, BBSS, QIDS Risk of self-harm, inpatient care, support needs, functioning, employment, housing Adult-TRAG	Among participants with either schizophrenia or schizoaffective disorder, positive (*p*<*001*) and negative symptoms (*p*=*0.028*) decreased statistically significantly. Among participants with bipolar disorder, psychiatric symptoms decreased statistically significantly (*p*=*0.049*). Participants with psychotic depression had no statistically significant change in symptoms. Among participants risk of self-harm decreased statistically significantly (*p*<*.001*), social support (*p*<*.001*) and functioning (*p*=*0.037*) increased statistically significantly	JBI Critical Appraisal Tool for Analytical Cross-Sectional Study, Positive response 5/8 (63%), study quality fair

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Štrkalj-Ivezić et al. 2013 (52) *Croatia*	Controlled evaluation study. Evaluated the rehabilitation day centre programme to examine whether the patients suffering from schizophrenia involved in the programme differ on the scales of social functioning, quality of life and self-esteem compared with a control group	Participants with schizophrenia (ICD-10 criteria), duration of disorder >5 years (n=98). Participants participated either in intervention or control group	Methods included in the interventions: social and life skills training, psychoeducation for participants and their family, stress management training, occupational therapy and communal rehabilitation. Length of intervention: 6 months	Quality of life MANSA Self-esteem RSE Social functioning OSA	Compared to the control group the intervention group had statistically significantly better quality of life ($p<0.001$), self-esteem ($p<0.001$) and social functioning ($p<0.001$)	JBI Critical Appraisal Tool for Quasi-Experimental Studies, Positive response 9/9 (100%), Study quality good
Lifshitz & Catz 2015 (60) *Israel*	Follow-up study (10-11-month follow-up). Evaluation of two rehabilitative programmes using Illness Management and Recovery (IMR)	Participants were 18–30 years and had been in inpatient treatment at least once during adolescence for severe mental illness (n=82). Participants participated either in Supportive Model Program (SMP) or Demanding Model Program (DMP)	In SMP participants lived with their parents and were offered intensive individual and group support. Methods of SMP: IMR, supported employment 1 day/ week. In DMP participants lived in residential accommodation with communal rehabilitation. Participants were not offered specific support for mental health disorders but were offered training in skills. Methods of DMP: IMR, supported employment 5 days/ week	Self-Perceived mental well-being, work performance, semi-structured questionnaire/ interview	Among participants of the SMP group, symptom management improved after the intervention. Both rehabilitation interventions increased participants' self-esteem and hope. Among participants of SMP group, 8 (20%) participants and DMP group 15 (94%) participants lived independently and were either studying or working in the open market after the intervention	JBI Critical Appraisal Tool for Analytical Cross-Sectional Study, Positive response 1/8 (13%), Study quality poor

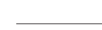
Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Buonocore et al. 2018 (53) *Italy*	Retrospective study. Evaluated recovery in a sample of patients with chronic schizophrenia engaged in rehabilitation programmes and explored contributing factors, with a focus on socio-cognitive rehabilitative interventions	Persons older than 18 years with schizophrenia (DSM-IV criteria). In clinical balance, for example, no changes in medication in the prior 6 months between 9/2014–5/2016 (n=104). Exclusion criteria: substance use, mood or personality disorder, developmental disability or neurological disorder. Participants participated in either Theory of Mind (ToM) group intervention, CR and psychiatric rehabilitation or CR and psychiatric rehabilitation	Methods of the intervention: psychoeducation, verbal communication, social skill training and problem-solving, parts of psychological therapy and a rehabilitation programme for social skills in accommodation, work and leisure. Frequency 3h*3 times a week. Additionally, Computer-aided CR 1h*3 times a week for 3 months and ToM group intervention 1h*2 times a week, in total 18 times. Mean length of intervention 15 months	Psychiatric symptoms PANSS Cognitive performance WAIS-R Neurocognitive performance BACS ToM PST A-version Functioning QLS	Among participants, recovery (measured by quality of life), CR, ToM and psychiatric rehabilitation was statistically significantly more effective than the comparator (*p=0.03*). 57% of participants were recovered (measured by quality of life)	JBI Critical Appraisal Tool for Analytical Cross-Sectional Study, Positive response 6/8 (75%), Study quality good

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Paziuc et al. 2018 (46) *Romania*	Quasi-Experimental study. Follow-up study (2-year follow-up). Evaluated the intervention impact, in comparison with standard treatment, on reducing symptoms and improving the overall level of functioning in a sample of participants diagnosed with depression and schizophrenia	Persons between 18–60 years with schizophrenia or depression (ICD-10 criteria), length of illness <1 year (n=91). Exclusion criteria: developmental disability and substance use disorder. Participants participated in one of four groups: Schizophrenia intervention or control, depression intervention or control	Outpatient intervention with assessment of needs and strengths-based individual planning of rehabilitation with multidisciplinary group, participant and their social network. Methods included: case management, psychoeducation, symptom and crisis management, lifestyle intervention and somatic health care, medication management and adherence, day structure, guided leisure activities, family interventions and judicial assistance. Mean length of intervention 2 years	Psychiatric symptoms PANSS, BDI Functioning GAF Inpatient treatment amount and length from registers	Among participants of the intervention group with schizophrenia, functioning improved ($p=0.005$) and positive ($p=0.005$), negative symptoms ($p=0.04$), all symptoms ($p=0.001$) and use of inpatient treatment ($p<0.05$) decreased statistically significantly compared to control group. Among participants of the intervention group with depression, functioning improved ($p<0.05$) and depression symptoms ($p<0.05$) decreased statistically significantly compared to control	JBI Critical Appraisal Tool for Quasi-Experimental Studies, Positive response 7/9 (78%), Study quality good

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Tan et al. 2018 (55) *Singapore*	Retrospective study. Evaluated factors associated with improvement in community functioning after a period of outpatient rehabilitation	Persons with mental disorder in outpatient care rehabilitation in 2014 (n=233)	Occupational Therapy: Activities, Vocation, Empowerment (OcTAVE) intervention is an occupational therapy outpatient treatment. It comprises three types of service: 1. clinical psychiatric rehabilitation with IMR, CR and lifestyle interventions, 2. Vocational rehabilitation intervention with 3–6 months of training, for example, in a coffee shop, 3. Creative therapies in a group or if needed individually. Mean length of intervention 177 days	Community skills MCAS Recovery MORS Inpatient treatment one year before and after intervention, length of intervention from registers	All intervention services increased recovery statistically significantly ($p=0.05$): clinical rehabilitation ($p<0.001$), vocational rehabilitation ($p<0.001$) and creative therapies ($p=0.006$). All intervention services improved community skills statistically significantly ($p<0.05$): clinical rehabilitation ($p<0.001$), vocational rehabilitation ($p<0.001$) and creative therapies ($p=0.021$). Clinical rehabilitation was statistically significantly more effective than creative therapies for participant recovery ($p=0.027$)	JBI Critical Appraisal Tool for Quasi-Experimental Studies, Positive response 7/9 (78%), Study quality good

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Maxwell et al. 2019 (50) *Australia*	Retrospective Cohort study. Follow-up study (1-year follow-up). Evaluated the effectiveness of rehabilitation for improving psychosocial function in individuals with schizophrenia	Persons who were in rehabilitation for more than 21 days and main diagnosis was psychosis disorder between 3/2009–6/2014. (n=210). Persons in local mental health services who had at least one inpatient or emergency department contact because of mental health reasons during the five years between 2009–6/2014. Persons with a main diagnosis of a psychotic disorder, a low score in HoNOS scales overactive, aggressive, disturbed or agitated behaviour and positive symptoms and living in the community at the time of the study (n=114). Exclusion criteria: inpatient treatment in the previous six months. Participants participated in either rehabilitation group or comparison group	Outpatient intervention with a focus of goal attainment and support for participant autonomy. Participants had individual plans and day structures based on their goals. They were encouraged to participate in group rehabilitation. Methods of intervention: social skills training, psychoeducation, guidance in activities of daily living and physical health, social inclusion, vocational rehabilitation and family therapy	Effectiveness of rehabilitation HoNOS Activities of Daily Living LSP Psychiatric symptoms K-10	Rehabilitation was statistically effective ($p<0.01$) when comparing rehabilitation and comparison groups from baseline to after the intervention, but not at follow-up ($p<0.01$). A clinically significant improvement was gained with 23 (33%) participants from baseline to after the intervention, at follow-up 11 (46%) participants were able to maintain the improvement. Functioning in activities of daily living improved statistically significantly ($p=0.04$) from baseline to after the intervention. Participants' psychiatric symptoms had no statistically significant change from baseline to after the rehabilitation or at follow-up	JBI Critical Appraisal Tool for Cohort Studies, Positive response 7/13 (54%), Study quality fair

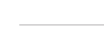
Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Nibbio et al. 2020 (47) *Italy*	Cross-sectional analytical study. Evaluated the feasibility and effectiveness of clinical and real-world outcomes of an integrated treatment protocol	Persons between 18–60 years with schizophrenia or schizoaffective disorder (DSM-V criteria) and in clinical balance (for example, no changes in medication in the past three months) (n=79). Exclusion criteria: developmental disability, neurocognitive or neurological disorder, other severe or unstable disorder	Rehabilitation centre in hospital settings. Methods included in the interventions: individual and communal rehabilitation, leisure activities, medication, computer-aided CR, followed by Social Skills Training. Length of rehabilitation varied from 6 to 12 months	Social, real-world and psychological functioning GAF Psychiatric symptoms PANSS Severity of symptoms CGI-S	Participants had a statistically significant decrease in positive, negative and all symptoms (*p<0.001*), severity of symptoms (*p<0.001*) and an increase in functioning (*p<0.001*) from baseline to after rehabilitation	JBI Critical Appraisal Tool for Analytical Cross-Sectional Study, Positive response 8/8 (100%), Study quality good
Tsoutsoulis et al. 2020 (56) *Australia*	A propensity score-matched case control study. Follow-up time one year. Evaluated the impact of inpatient mental health rehabilitation using metrics of psychiatric readmission	Persons with a mental health disorder, who were admitted to non-acute psychiatric inpatient treatment (length over 21 days) (n=252). Participants participated either in intervention or control group	Intervention was based on the National Framework for Recovery-oriented Mental Health Services. In cooperation with the multidisciplinary team and the participant, an individual plan for the participant, based also on standardized assessment. Methods included in the intervention: training of activities of daily living and social skills, psychoeducation, family therapy, vocational rehabilitation and lifestyle intervention. Group therapies for symptom management and substance use dependence	Number of inpatient treatments one year before and after the intervention; after the intervention, number of days to next inpatient treatment from registers	For participants in the intervention group, use of inpatient treatment decreased statistically significantly (from 100% to 33%, *p<0.01*) from baseline to follow-up. In the control group, the use of inpatient treatment stayed at the same level from baseline to follow-up. For participants in the intervention group, time between inpatient treatments increased statistically significantly (from mean 110 days to 152 days, *p=0.01*) from baseline to follow-up. In the control group, the time between inpatient treatments stayed at the same level from baseline to follow-up	JBI Critical Appraisal Tool for Cohort Studies, Positive response 10/11 (91%), Study quality good



Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Rathod et al. 2020 (57) *England*	Non-Randomized Controlled Trial. Follow-up study (1-year follow-up). Evaluated whether a new intervention was feasible, acceptable and effective, meeting quality standards in a timely manner	Persons with a psychosis disorder (n=1762). Exclusion criteria: substantial substance use disorder. Participants participated in either Treatment and Recovery in PsycHosis (TRIumPH) or control group	TRIumPH intervention consisted of assessment and intervention phases. Intervention was planned in cooperation with the participant. Methods included in the intervention: support to participant from the professionals, medication management, somatic health management every 12 weeks, cognitive behavioural therapy for psychosis, family intervention and support in employment	Psychiatric symptoms HoNOS Care pathways and intervention timelines, referrals to mental health services, length of inpatient treatments, involuntary treatment orders, emergency room visits and acute contacts, reasons for sign out to evaluate referrals, expenses for service use registers. Participant satisfaction and acceptability of the intervention: service provider satisfaction and acceptability of the intervention interviews	Among participants in the TRIumPH group, problems in relationships (*p=0.013*) and in employment and activities (*p=0.037*) decreased statistically significantly from baseline to follow-up. Participants in the control group had a statistically significant decrease in problems with activities of daily living (*p=0.04*). TRIumPH group participants had statistically significantly fewer contacts to the criminal justice system (*p<0.0001*), instead in the control group contacts increased (*p<0.0001*). In each study group, in- or outpatient treatment had no statistically significant changes. Participants were satisfied with services and felt that the working relationship with the service provider was good. Service providers were satisfied with services and felt that the care path was useful	JBI Critical Appraisal Tool for Quasi-Experimental Studies, Positive response 6/9 (67%), Study quality fair

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Siskind et al. 2020 (44) *Australia*	Retrospective register study. Described the characteristics of service users referred to MIRT over a 20-month time period, and reported on their discharge location	Persons in The Mobile Intensive Rehabilitation Team (MIRT) service between 1.1.2017–30.8.2019 (n=167)	The Mobile Intensive Rehabilitation Team (MIRT) is based on Assertive Community Treatment. MIRT provides a limited time service. Intervention included: case management, and individually or in a group self-management, cognitive remediation, social cognition training, cognitive behavioural therapy for psychosis, sensor modulation, yoga, swimming, walking and cooking. Median length of intervention 23 months	Functioning and psychiatric symptoms HoNOS Psychiatric inpatient treatment during follow-up; contacts after discharge from registers	Functioning improved and psychiatric symptoms decreased (*p=0.002*) statistically significantly at follow-up	JBI Critical Appraisal Tool for Analytical Cross-Sectional Study, Positive response 4/8 (50%), Study quality fair
Çoker et al. 2021 (43) *Turkey*	Descriptive register study. Aim was to examine the effects of rehabilitation services related to the frequency of hospitalization, severity of disease symptoms, functional recovery and insight in patients with schizophrenia	Service users of the community mental health centre between 2/2011-12/2017 (n=47)	Community mental health centre intervention includes an individual rehabilitation plan, formulated together with the participant and their family. Intervention included: case management, medication management, support in somatic health, psychoeducation, guidance in social skills, activities of daily living and leisure. Service providers did home and workplace visits as a part of the intervention	Psychiatric symptoms PANSS Functioning FROGS Insight SAI Inpatient treatments amount and length from registers	Number of inpatient treatments decreased statistically significantly from prior to after the intervention (*p>0.05*). Global psychiatric (*p>0.001*), positive (*p>0.001*) and negative symptoms (*p>0.001*) decreased statistically significantly. Functioning (*p>0.001*) and insight (*p>0.001*) improved statistically significantly	JBI Critical Appraisal Tool for Analytical Cross-Sectional Study, Positive response 6/8 (75%), Study quality good

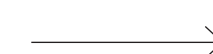
Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Reigenhaus et al. 2022 (48) *Austria*	Cross-Sectional analytical study. The aim of this study was to determine the effects of a psychiatric rehabilitation programme on individuals with different mood states	Persons with a mood or anxiety disorder (ICD-10 criteria) between 4/2015–4/2017 (n=118). Participants were divided into groups with BDI-II and HAMD: euthymia (BDI-II <9 and HAMD >8) or severe depression (BDI-II and HAMD <19). Exclusion criteria schizophrenia, substance use or neurodegenerative disorder and developmental disability	Intervention was conducted in a psychiatric rehabilitation centre specialized in mood and stress disorders. Intervention included: medication management, cognitive behavioural therapy group 2h per week for first two weeks and 1h per week for four weeks (altogether 8h) and individually 1h two times, occupational therapy 6h per week, physiotherapy, diet consultation and physical training. Length of intervention six weeks	Depressive symptoms BDI-II, HDRS Psychiatric symptoms SCL-90-R Stress MBI-GS-D, SVF-78 Tedium TM	Psychiatric symptoms ($p<0.01$) and tedium ($p<0.01$) decreased in both groups. The use of positive coping strategies increased statistically significantly ($p<0.05$) and the use of negative coping strategies decreased ($p<0.01$) in both groups	JBI Critical Appraisal Tool for Quasi-Experimental Studies, Positive response 6/9 (67%), Study quality fair
Optimal Treatment Project (OTP) studies						
Falloon et al. 2004 (34) *Multicentre study: Turkey, Sweden, Italy, Norway, Greece, Germany, Hungary, Spain, New-Zealand, Japan*	Cohort study. Summarized the outcome after 24 months of optimal treatment project (OTP)	Persons with a diagnosis of schizophrenic disorder (DSM-IV criteria) (n=603). Participants participated in either OTP group or case management group	OTP intervention included: minimally effective antipsychotic medication targeted individually (symptoms, side effects), psychoeducation to participants and relatives, case management, goal-oriented social and vocational training and symptom management. Multidisciplinary teams offered 60–100h workshop training for the intervention. Length of intervention at least two years	Mental Functions MFIS Disability DI Caregiver stress GCS	Participant mental functions had improved for 244 (41%) participants, and disability for 232 (39%), and caregiver stress for 285 (48%) participants decreased. Mental functions had improved more in the OTP group (OTP 48%; Case management 21%). Disability (OTP 53%; Case management 16%) and caregiver stress (OTP 63%; Case management 15%) decreased more compared to the case management group. In the OTP group there were 35% and in the case management group 10% of participants in full recovery (criteria, no disability measured with Disability Index)	JBI Critical Appraisal Tool for Cohort Studies, Positive response 2/11 (18%), Study quality poor



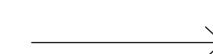
Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Economou et al. 2005 (33) *Greece*	Cohort study. Follow-up study (4-year follow-up). Assessed prospectively aggressive and sexual misconduct	Persons with a diagnosis of schizophrenic disorder (DSM-IV criteria) (n=51)	OTP intervention included: minimally effective antipsychotic medication targeted individually (symptoms, side effects), psychoeducation to participants and relatives, case management, goal-oriented social and vocational training and symptom management. Multidisciplinary teams offered 60–100h workshop training for the intervention. Length of intervention at least two years	Misconduct: OTP-misconduct checklist Accommodation, education, employment, duration of disorder, course of disorder, clinical impairment, multi-axial diagnosis, social disability and support, caregiver stress, cooperation with treatment, justice system involvement and prison commitments, treatments received structured assessment	Participant misconduct decreased from the start of OTP intervention (n=11, 22%) to follow-up (n=3, 5.9%)	JBI Critical Appraisal Tool for Cohort Studies, Positive response 3/11 (27%), Study quality fair

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Economou et al. 2011 (35) *Greece* Partly overlapping sample with (33)	Cohort study. Follow-up study (4-year follow-up). Evaluating the effectiveness of the routine use of a continued integrative treatment approach in promoting clinical and social recovery from schizophrenia over 4 years	Persons with a diagnosis of schizophrenia or schizoaffective disorder (DSM-IV criteria) (n=60)	OTP intervention included: minimally effective antipsychotic medication targeted individually (symptoms, side effects), psychoeducation to participants and relatives, case management, goal-oriented social and vocational training and symptom management. Multidisciplinary teams offered 60–100h workshop training for the intervention. Length of intervention at least two years	Functioning GAF, DI Cognitive Functioning MFIS Caregiver stress GCS Accommodation, employment (hours per week) and days in hospital from registers	Participant functioning ($p<0.004$–$p<0.0001$) and cognitive performance ($p<0.0001$) had a statistically significant improvement and caregiver stress decreased statistically significantly ($p<0.0001$) from baseline to follow-up. Participants had a statistically significant increase in employed days per week ($p<0.0001$) from baseline to follow-up. At follow-up, 7 (12%) were working in the open labour market, 24 (40%) in vocational rehabilitation and 27 (45%) were unemployed. At baseline, in full recovery were 3 (5%) and partial recovery 7 (12%) of the participants. At follow-up, in full recovery were 9 (15%) and partial recovery 22 (37%) of the participants	JBI Critical Appraisal Tool for Cohort Studies, Positive response 5/11 (45%), Study quality fair

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Boston Psychiatric Rehabilitation (BPR) studies						
Gigantesco et al. 2006 (37) *Italy*	Randomized controlled trial. Investigated whether a specific structured planning and evaluation approach called VADO (in English, Skills Assessment and Definition of Goals) resulted in improved personal and social functioning among patients with chronic schizophrenia	Persons between 18–65 years with schizophrenia, schizoaffective or delusional disorder (ICD-10 criteria), FPS global functioning score <70 and medication in balance (n=85). Exclusion criteria: disabling physical or psycho-organic illness or developmental disability, co-occurring psychological or family interventions. Participants participated in either VADO group or Treatment as Usual (TAU) group	VADO intervention based on Boston Psychiatric (BPR) Rehabilitation approach. Intervention included a model for goal setting and rehabilitation planning. Intervention does not include specific psychiatric rehabilitation interventions but encourages model learning, encouragement, roleplaying and problem-solving methods in training. Self-management is based on stress-vulnerability model and early signs of relapse. Motivational interviewing is recommended especially for medication adherence	Psychiatric symptoms BPRS Functioning and social functioning PSP (modified version of SOFAS)	Participants of the VADO group had a statistically significant improvement in functioning (at 6 months *p<0.05*; at one year *p<0.01*) compared to TAU group. Participants of the VADO group had a statistically significant improvement in psychiatric symptoms (at 6 months p<0.05) compared to TAU group, but the change was not maintained at one year. Participants of the VADO group reached 75% of set goals by year one	JBI Critical Appraisal Tool for Randomized Controlled Trials, Positive response 10/13 (77%), Study quality good



Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Pioli et al. 2006 (36) *Italy*	Partially randomized controlled trial. Aim was to assess if a specific structured planning and evaluation manual, called VADO (in English, Skills Assessment and Definition of Goals), is more effective than routine interventions in reducing disability in patients with schizophrenia	Persons between 18–65 years with schizophrenia, schizoaffective or delusional disorder (ICD-10 criteria), FPS global functioning score <70 and medication in balance (n=98). Exclusion criteria: disabling physical or psycho-organic illness or developmental disability, co-occurring psychological or family interventions. Participants participated in either VADO, experimental or control group	VADO intervention based on Boston Psychiatric (BPR) Rehabilitation approach. Intervention included a model for goal setting and rehabilitation planning. Intervention does not include specific psychiatric rehabilitation interventions but encourages model learning, encouragement, roleplaying and problem-solving methods in training. Self-management is based on stress-vulnerability model and early signs of relapse. Motivational interviewing is recommended especially for medication adherence	Psychiatric symptoms BPRS Functioning and social functioning PSP (modified version of SOFAS)	Participants of the VADO group had a statistically significant improvement in social functioning ($p<0.05$) compared to control group. Participants of the VADO group had a statistically significant improvement in positive symptoms ($p<0.01$), symptoms of mania ($p=0.04$) and overall symptoms ($p=0.04$)	JBI Critical Appraisal Tool for Randomized Controlled Trials, Positive response 7/13 (54%), Study quality fair



Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Swildens et al. 2011 (40) *Netherlands*	Randomized controlled trial. Investigated the effect of the Boston Psychiatric Rehabilitation (BPR) approach on attainment of personal rehabilitation goals, social functioning, empowerment, needs for care and quality of life in people with severe mental illness (SMI) in the Netherlands	Persons with a severe mental disorder with the willingness to make a change in the areas of employment, education, social contacts or living environment between 6/2005–6/2006 (n=156). Exclusion criteria: a contact with a rehabilitation worker in the previous three months. Participants participated in either BPR or Treatment as Usual (TAU) group	Intervention based on BPR approach, and the main goal to support participants in formulating and attaining their individual goals in different areas of living. Intervention consists of three phases: 1) Evaluation and setting goals, 2) Planning of the rehabilitation, and 3) Rehabilitation with skills training and support acquiring the resources needed for goal attainment. The multidisciplinary team had training for BPR approach. Frequency at least one time in three weeks	Social functioning SFS Empowerment PES Assessment of needs CANSAS Quality of life WHOQOL-BREF Functioning GAF-SD Use of services CSSRI-EU Rehabilitation process WAI Knowledge of caregiver PRBGP Goal attainment, change in employment, change in accommodation, interview and questionnaire	Participants of the BPR group were employed (paid employment 36%, vocational rehabilitation 40%, voluntary work 28%, education 50%) more often with statistical significance (*p=0.01*). After two years participants of the BPR group had attained their goals more likely. BPR was more effective in goals of social functioning (including education and employment) (BPR 56%; TAU 28%) and social contacts (BPR 50%; TAU 25%), but not goals on housing (BPR 38%; TAU 50%). Quality of life improved and needs were met better in both groups. Social functioning (excluding employment), empowerment or independent living did not increase in either group	JBI Critical Appraisal Tool for Randomized Controlled Trials, Positive response 7/13 (54%), Study quality fair

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Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Jormfeldt et al. 2014 (38) *Sweden*	Qualitative study. The purpose of this study was to describe and explore client experiences of the BPR in Sweden	Persons with a severe mental disorder over 18 years, who had been in mental health services less than two years, with the willingness to make a change in employment, education, living situation or leisure (n=10)	Intervention based on BPR approach, and the main goal to support participants in formulating and attaining their individual goals in different areas of living. Intervention consists of three phases: 1) Evaluation and setting goals, 2) Planning of the rehabilitation, and 3) Rehabilitation with skills training and support acquiring the resources needed for goal attainment. The multidisciplinary team had training for BPR approach	Experiences in rehabilitation process, functioning in activities of daily living, trust in service providers, service providers competence, self-determination, goal setting semi-structured interview	BPR was experienced to increase community participation through self-understanding, new perspectives and trusting relationships	JBI Critical Appraisal Tool for Qualitative Studies, Positive response 8/10 (80%), Study quality good

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Svedberg et al. 2014 (39) *Sweden* Overlapping sample with (38)	Follow-up study (2-year follow-up). The aim was to investigate the outcome of the BPR intervention regarding changes in life situation, use of healthcare services, quality of life, health, psychosocial functioning and empowerment	Persons with a severe mental disorder over 18 years, who had been in mental health services less than two years, with the willingness to make a change in employment, education, living situation or leisure (n=71)	Intervention based on BPR approach, and the main goal to support participants in formulating and attaining their individual goals in different areas of living. Intervention consists of three phases: 1) Evaluation and setting goals, 2) Planning of the rehabilitation, and 3) Rehabilitation with skills training and support acquiring the resources needed for goal attainment. The multidisciplinary team had training for BPR approach	Quality of life MANSA Assessment of needs CANSAS Empowerment MDQ Psychosocial functioning GAF-SD Health HQ Changes in life situation, use of health services, goal attainment questionnaire	Participants had no statistically significant changes in accommodation, education or leisure activities, but participant employment had a statistically significant increase (*p=0.001*) at follow-up. Participant quality of life (*p=0.039*), empowerment(*p=0.013*) and psychosocial functioning (*p=0.001*) had improved statistically significantly at follow-up. Participant contact to mental health services decreased statistically significantly at follow-up (*p<0.01*). Participant unmet needs had decreased statistically significantly at follow-up (*p=0.042*). Fewer participants received retirement benefit when compared from baseline to follow-up (baseline 41%; follow-up 35%). At follow-up of the participants, 24% had full, 65% partial and 35% no goal attainment. Participants who had achieved their goals had statistically significantly better health (*p=0.001*), empowerment (*p=0.001*), quality of life (*p=0.001*) and psychosocial functioning (*p=0.001*)	JBI Critical Appraisal Tool for Analytical Cross-Sectional Study, Positive response 5/8 (63%), Study quality fair

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Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Sanches et al. 2020 (42) *Netherlands*	Randomized controlled trial. Establish the effectiveness with which the Boston University approach to Psychiatric Rehabilitation (BPR) improves the level of social participation in people with SMI, in the Netherlands	Persons with a severe mental disorder (DSM-IV/V criteria) between 18–64 years, a long-term contact with mental health services, functional impairments and the willingness to change their social participation (n=188). Exclusion criteria: in inpatient treatment at the start of the trial, but persons with an eating disorder (n=10), whose inpatient treatment was due to low weight were included in the study. Participants participated in either BPR or control group	The purpose of the BPR approach is to achieve and maintain goals in four areas, accommodation, education, employment and social contacts. BPR consists of four phases: 1) seeking rehabilitation goals, 2) choosing rehabilitation goals, 3) attaining rehabilitation goals, and 4) maintaining rehabilitation goals. The service providers were trained to use the BPR approach. Frequency at least once per two weeks	Social participation Occupation and Employment SFS and Dutch National Societal Participation Ladder Quality of life MANSA Personal recovery RAS Self-efficacy GSES Psychosocial functioning GAF-SD, BPRS Therapeutic alliance HAS Employed/ unemployed, hours in paid employment or other employment, rehabilitation goal, attained from registers	Social participation (including employment) had increased statistically significantly in both groups (*p=0.022–p=0.005*). Quality of life (*p=0.001*) and psychosocial functioning (*p=0.022*) improved in both groups. Of the participants of BPR 44% and of control group 42% had attained their goals	JBI Critical Appraisal Tool for Randomized Controlled Trials, Positive response 8/13 (62%), Study quality fair

Authors, year of publication, Country of origin	Study design and purpose	Population and sample size	Description of the intervention	Outcomes	Key findings	Critical appraisal
Sanches et al. 2022 (41) *Netherlands* Overlapping sample with (42)	Randomized controlled trial. Follow-up study (1-year follow-up). Purpose was to investigate the cost-effectiveness and budget impact of the Boston Psychiatric Rehabilitation (BPR) approach to an active control condition to increase social participation	Persons with a severe mental disorder (DSM-IV/V criteria) between 18–64 years, a long-term contact with mental health services, functional impairments and the willingness to change their social participation (n=188). Exclusion criteria: in inpatient treatment at the start of the trial, but persons with an eating disorder (n=10), whose inpatient treatment was due to low weight were included in the study. Participants participated in either BPR or control group	The purpose of the BPR approach is to achieve and maintain goals in four areas, accommodation, education, employment and social contacts. BPR consists of four phases: 1) seeking rehabilitation goals, 2) choosing rehabilitation goals, 3) attaining rehabilitation goals, and 4) maintaining rehabilitation goals. The service providers were trained to use the BPR approach. Frequency at least once per two weeks	Costs TIC-P Cost-Effectiveness QALY, SF-6D Social participation SFS Occupation and Employment Increased costs in relation to social participation, budget impacts	Costs per participant were in BPR 12 866 € and in control group 12 012 €. There was not a statistically significant difference in cost-efficacy between groups. Most costs were due to residential accommodation, inpatient care, outpatient care and activities	JBI Critical Appraisal Tool for Randomized Controlled Trials, Positive response 7/13 (54%), Study quality fair

Adult-TRAG=The Adult Texas Recommended Assessment Guidelines, BACS=Brief Assessment of Cognition in Schizophrenia, BBSS=Brief Bipolar Symptom Scale, BDI=Beck Depression Inventory, BNSA=Brief Negative Symptom Assessment, BPRS=Brief Psychiatric Rating Scale, CAN=Camberwell Assessment of Need, CANSAS=Camberwell Assessment of Need Short Appraisal Schedule, CGI-S=Clinical Global Impression-Severity Scale, CPT=Continuous Performance Test, CSSRI-EU=The Client Socio-demographic and Service Receipt Inventory–European version, DI=Disability Index, FROGS=The Functional Remission of General Schizophrenia Scale, FPS=The VADO Personal and Social Functioning Scale, GAF=Global Assessment of Functioning, GAF-SD=Symptoms and Disabilities version of the Global Assessment of Functioning Scale, GCS=Global Carer Stress, GSES=General Self-Efficacy Scale, HAMD=Hamilton Depression Scale, HAS=Helping Alliance Scale, HDRS=Hamilton Depression Rating Scale, HoNOS=The Health of the Nation Outcome Scales, HQ=Health Questionnaire, K-10=The Kessler Psychological Distress Scale, LSP=The Life Skills Profile, MANSA=Manchester Short Assessment of Quality of Life, MBI-GS-D=Maslach Burnout Inventory – General Survey, MCAS=Multnomah Community Ability Scales, MDQ=Making Decisions Questionnaire, MFIS=Mental Functions Impairment Scale, MORS=Milestones of Recovery Scale, OSA=Occupational Self-Assessment, PANSS=Positive and Negative Syndrome Scale, PES=The Personal Empowerment Scale, PSP=Personal and Social Functioning Scale, PST=Picture Sequencing Task, PRBGP=Psychiatric Rehabilitation Beliefs, Goals and Practices Scale, PSRS=Positive Symptom Rating Scale, QALY=Quality Adjusted Life Year, QIDS=Quick Inventory for Depressive Symptomology, QLS=Heinrichs Quality of Life Scale, RAS=Recovery Assessment Scale, RSE=Rosenberg Self-Esteem Scale, SAI=The Schedule for Assessment of Insight, SCL-90-R=The Symptom Checklist – Revised, SF-6D=Short Form Health Survey, SFS=The Social Functioning Scale, SPRS=Special Problems Rating Scale, SVF-78=The Stress Coping Questionnaire, TIC-P=Treatment Inventory of Costs in Patients with psychiatric disorders, TM =The Tedium Measures, WAI=Working Alliance Inventory, WAIS-R=Wechsler Adult Intelligence Scale – Revised, WCST=Wisconsin Card Sorting Test, WHOQOL-BREF=the World Health Organization Quality of Life Assessment –abbreviated

DESCRIPTION OF THE COMBINATIONS OF PSYCHIATRIC REHABILITATION INTERVENTIONS

The studies were mostly done in outpatient care (18, 55.6%), one (3.7%) was partially in a residential accommodation and partially in outpatient care and seven (25.9%) studies were conducted in hospital settings. Combinations of psychiatric rehabilitation had a mean of four methods merged, ranging from three to eight. Details of all 24 psychiatric interventions are presented in *Supplementary Table 3*. Mean, median or other specified length of intervention was reported in 18 studies (range 1.5 to 77 months, mean 15 months).

There were three studies (11.1%) of the Optimal Treatment Project (OTP) [33–35] and seven studies (29.6%) of Boston Psychiatric Rehabilitation (BPR) approach [36–42]. OTP was a multicentre study with the goal of advancing the routine use of evidence-based methods for mental disorders with continuous evaluation of outcomes. OPT intervention included four psychiatric rehabilitation methods [34]. The BPR approach of psychiatric rehabilitation was developed mainly for goal setting and attainment, as well as rehabilitation planning [8], with varying other methods included depending on the study.

EFFECTIVENESS OF COMBINATIONS OF PSYCHIATRIC REHABILITATION INTERVENTIONS

Psychiatric symptoms

Participant global psychiatric symptoms decreased statistically significantly in eight studies [36,37,43–48] from baseline to after rehabilitation. However, according to one study the result was not maintained at one year [37]. Positive symptoms of psychosis decreased statistically significantly in five studies [36,43,45–47] and negative symptoms decreased statistically significantly in four studies [43,45–47]. One study found a statistically significant decrease in depressive symptoms [46] and mania symptoms [36]. In one RCT [49] and one cohort study [50] they did not find changes in any psychiatric symptoms from baseline to the end of the intervention.

Functioning, cognitive performance and ability to work

Overall functioning had improved statistically significantly in nine studies [35,37,39,43–47,50]. In a RCT study both the intervention and the control group had a statistically significant improvement in psychosocial functioning from baseline to the end of the intervention, but there was no difference between groups [42]. Cognitive performance improved statistically significantly in three studies [35,49,51].

One study found that social functioning improved statistically significantly [52] and in another study there was no change in social functioning after psychiatric rehabilitation [40]. An RCT study found that social participation increased statistically significantly in both the intervention and the control group from baseline to the end of the intervention, but no difference between groups was found [42]. Participants of OTP intervention had a statistically significant increase in days in employment per week [35]. For participants of BPR, employment had increased statistically significantly and fewer participants received retirement benefit when compared from baseline to follow-up [39].

Recovery and quality of life

In four studies participants' quality of life improved statistically significantly [39,49,51,52]. In two RCT studies of the BPR approach and control intervention, both improved participants' quality of life over two years [40,42].

After psychiatric rehabilitation, when measured with a disability measure, 35% of participants were in recovery (no significant impairment or disability) [34]. When recovery was measured by quality of life, 57% of participants were recovered [53], and when using the criteria by Warner (economic independence, independent living and functioning at premorbid level) [54], 15% of participants were considered to be in recovery [35]. One study concluded that psychiatric rehabilitation increased personal recovery statistically significantly [55].

Goal attainment

Participants of the planning and evaluation intervention, called VADO (in English, Skills Assessment and Definition of Goals), reached 75% of set goals by year one [37]. In the BPR approach of the participants, 24% had full, 65% partial and 35% no goal attainment at two-year follow-up [39], and a RCT study of the same approach found that participants of the BPR group achieved 44% and control group 42% of set goals [42]. Goal attainment was statistically significantly predicted by less psychiatric symptoms at baseline and previous work experience [42]. Persons who had achieved their goals had statistically significantly better health, empowerment, quality of life and psychosocial functioning [39].

Use and experiences of services

Participants use of inpatient care was investigated in seven studies yielding mixed results: three studies with a statistically significant decrease [43,46,56] and three studies with no statistically significant effect [35,45,57]. Svedberg and colleagues (2014) reported a statistically significant decrease in the use of mental health services from baseline to after BPR approach [39]. There was only one study investigating the cost-effectiveness of a combination of psychiatric rehabilitation interventions. In that study the BPR approach was not found cost-effective compared to an active control condition [41].

Service users of combinations of psychiatric interventions were satisfied with services, felt that the working relationship with the service provider was satisfactory [57] and that these interventions increased community participation [38]. Improvements could be made with more stable service user and provider relationships and wider opening hours. Service providers were satisfied with services and felt that combinations of interventions were useful. However, service providers felt that the workload was considerable and that service users discontinuing interventions was a challenge [57].

Social, behavioural and psychological outcomes

Of the included studies, four studied participants had unmet needs [39,40,58,59]. In one study there were less unmet needs for both the intervention group and treatment as usual group at the end of rehabilitation [40]. In another study participants' unmet needs had decreased statistically significantly from baseline to two-year follow-up [39].

In studies on combinations of psychiatric rehabilitation, participant self-esteem increased statistically significantly [52], as well as their empowerment [39], self-directiveness [51], insight [43] and mental functions [34]. Reininghaus and companions (2022) concluded that the use of positive coping strategies increased while the use of negative coping strategies decreased statistically significantly after a combination of psychiatric rehabilitation methods [48]. In addition, in one study risk of self-harm decreased statistically significantly [45].

In combinations of psychiatric rehabilitation, participant social support increased [45], social relationships improved (50) and caregiver stress decreased statistically significantly [34]. Rathod and colleagues (2020) in their study found that the intervention group compared to control condition participants had statistically significantly fewer contacts to the criminal justice system [57], and in one study, participant misconduct decreased from the start of intervention compared to four-year follow-up [35].

RESULTS OF THE QUALITY APPRAISAL OF THE INCLUDED STUDIES

Of the included studies, 9/27 (33.3%) were assessed to be of good quality, the most 16/27 (59.3%) of fair quality and 2/27 (7.4%) were of poor quality (*Table 2*). Two studies [47,52] were assessed with a rating of 100% and the poorest rating for a study was 12.5% [60].

Retrospective studies had problems with the validity and reliability of the measurements, as data was gathered retrospectively from registers. Data had been recorded by professionals with different education and clinical experience and not for study purposes. Due to this, there was a lot of missing data in several studies. For example, in Maxwell and colleagues' (2018) study, they had a sample size of 210 persons with a psychotic disorder. However, they had only 70 (33.3%) participants with complete data on one of the three outcome measures at all data points [50]. In a few quantitative studies, the research design did not use validated measures [33,56,60].

KNOWLEDGE USER CONSULTATION

Knowledge users recognize that psychiatric rehabilitation interventions are in varying use in Finland. Rehabilitation is designed and implemented individually, not planned in structured combinations of interventions. In the discussion, an expert by experience talked about their experience that a combination of psychiatric interventions had improved their quality of life and wellbeing. Regarding usability, a confidential collaborative relationship between service user and provider was seen as the fundamental basis of all interventions offered. In a collaborative relationship understandable language was seen as an essential issue.

Settings of combinations of psychiatric rehabilitation were a relevant issue to feasibility. Previously interventions were offered in diverse settings, for example, open inpatient facilities, day wards, closed wards, outpatient clinics and day activity centres. Nowadays in Finland the number of inpatient treatments has decreased and is mostly provided in closed wards. Open inpatient treatment was convenient for participants in combinations of psychiatric rehabilitation. Participants of the discussion felt that various treatment settings were needed for persons with severe mental illness that had long-term impairment in functioning. Continuity of services should be a meaningful wholeness from the

perspective of individuals' recovery. The future of psychiatric rehabilitation interventions in combination in Finland is affected by the Wellbeing County transitions and the financial resources of the society.

There were shortcomings in the blinding of the RCTs. Included studies were intervention studies which in many cases makes blinding of the executors and participants of the intervention impossible. This was the case, for example, in studies of the BPR approach [37,40]. Whereas in Cavallarro and colleagues' (2009) study, they were able to blind the participants as their cognitive remediation was either specified with neurological test for the participant or pseudo remediation with no specifications [49]. In all but one study [36], the interviewers and/or data gatherers were blinded to the treatment allocation.

In the included studies, confounding factors were usually identified but no statistical strategies were used to diminish their effect [e.g. 49]. There was also loss to follow-up in RCTs, Quasi-Experimental studies and Cohort Studies. The reasons for the loss were not always described in detail [e.g. 57]. In Sanches and colleagues' (2020, 2022) studies there are inconsistencies in the description of loss at follow-up. In the 2020 manuscript it states that the intervention group had a loss of 9.2% and treatment as usual (TAU) group 8.9%, however, in the 2022 article they are 29.6% for the intervention group and 22.2% for the TAU group [41,42].

DISCUSSION

We found 27 studies on combinations of psychiatric rehabilitation meeting the inclusion criteria. Most of the interventions were conducted in community mental services and a quarter in inpatient settings. There was scientific evidence mostly on the effectiveness of combinations of psychiatric rehabilitation in decreasing psychiatric symptoms and increasing functioning, as well as quality of life. There were shortcomings in the quality of the studies.

Combining results in this scoping review proved to be difficult because of the various instruments used in outcome evaluation. For example, in the four studies that assessed quality of life three different instruments were used: Heinrichs Quality of Life Scale [49,51], the World Health Organization Quality of Life Assessment –abbreviated version [52] and the Manchester Short Assessment of Quality of Life [42]. Furthermore, several combinations of psychiatric interventions had methods with the goal of improving participants' physical health [43,44,46,48,50,55,56]. However, only one study reported outcomes on health [39]. Persons with SMI have worse physical health compared to general population [61] so it is also important to pay attention to their physical health.

Attrition in interventions for SMI is recurrent [62,63] due to, for example, motivational issues [63] or worsening of psychiatric symptoms [36]. In the current review, reported studies conducted in community mental healthcare reported participants dropouts between 0–31% [34–36,39–42,49,51,60]. Dropouts from psychiatric rehabilitation combinations conducted in inpatient settings was reported in only one study (other studies were retrospective register studies), the rate being 9% [47]. Additionally, in a subgroup of a study performed in residential accommodation dropout was 21% [60]. One might propose that attending a comprehensive rehabilitation intervention, consuming time and other resources, might be more effortless when residing in the setting of the intervention. However, in many sources, outpatient mental health services produced in one's own living environment are suggested to be preferable [64,65]. It is also good to acknowledge that there are methods that cannot be conducted one-to-one, such as Social Skills Training groups [11]. Maybe a combination of residential and community psychiatric rehabilitation might be one solution, e.g. attending community leisure activities or day wards, as suggested by the knowledge users. These hypotheses could be beneficial to test with RCTs in the future.

In the knowledge user consultation, the working relationship between the service user and provider was raised as an important contributor to psychiatric rehabilitation practice. In the literature it has been found to be one mechanism of intervention in psychiatric rehabilitation [16,66]. However, it was not widely studied in the studies included in this review apart from some qualitative findings [38,57], although the use of case management was common in studies contained in the review, and more generally in mental health services [19]. The authors of this review want to point out the importance of working relationships on effectiveness of mental health interventions.

Peer interventions were not included in methods of combinations of psychiatric rehabilitation interventions in the current review (*Table 3*). However, some of the methods used, for example, communal rehabilitation and social skills training, also involved peer support. Peer support and interventions might be meaningful to include with combinations of psychiatric interventions for persons with SMI [67]. For the evolution of combinations of psychiatric

interventions, the more highlighted use of peer intervention might be beneficial [16,68].

Specialized early intervention services for first-episode psychosis and combinations of psychiatric interventions for persons with SMI have similarities and can be compared. First-episode psychosis interventions usually include regular check-ups and medication guidance, and additionally psychiatric rehabilitation interventions, such as case management, psychoeducation and family interventions [69–72]. Like findings in this review, first-episode psychosis interventions decrease positive and negative symptoms of psychosis [17,72–75] and improve cognitive performance [72]. They have also been found to improve functioning [72,74–76] and quality of life [70,76,77], the same as the results of this review. Participating in a first-episode psychosis intervention including supported employment has been found to increase participation in education and employment [70,78], much like the findings of OTP [35] and BPR interventions on increasing employment [39]. Contrary to the findings of Sanches and colleagues (2022) on BRP intervention not being cost-effective, one study found a first-episode psychosis intervention cost-effective [77]. Currently, in Finland the Helsinki Early Psychosis study is under way. One goal of the study project is to develop the care and care pathways for first-episode psychosis service users [79,80]. Several scientific articles of the results of the study have been published [e.g. 69,70].

In a recent study, geographical differences in the incidence of mental health disorders in Finland have been observed, and both the lowest and the highest number of mental health outpatient visits have been shown to be connected to a higher risk of receiving disability pension for a mental health disorder. This raises the question of the functioning of service systems and rehabilitative processes [82]. Furthermore, individuals' ability to make choices concerning their rehabilitation requires knowledge of the interventions being offered. This has been also noted in Finnish studies of patient experiences of mental health services, especially regarding understanding of treatment and rehabilitation plans [83]. It should not be a matter of geographical or service provider issues what psychiatric rehabilitation interventions (and their combinations) are offered to a person with SMI.

STRENGTHS AND LIMITATIONS

A major strength of this scoping review is the marginally studied subject of psychiatric rehabilitation intervention combinations. A quality appraisal of the included studies was also conducted, despite the inability to perform a detailed synthesis comparison of the quality appraisal of the studies. This was due to differences in research methods used, so that also different quality appraisal tools were utilized. It is also fair to say that the quality of the included studies was mediocre at best, for example, only two studies were given a 100% rating [47,52]. Additionally, there is no specific quality appraisal tool for retrospective studies. This affected the quality appraisal of the studies as criteria had to be assessed `not applicable´ in many instances, affecting the number of `yes´ answers [27].

Co-creation of the study design with knowledge users is recommended by JBI [22], and even though we were not able to use co-creation, we were able to include knowledge user consultation in the review [21]. Contrary to recommendations, due to time resources, only one researcher (JT) performed study screening phase as well as data extraction, and this must be considered a limitation of the study.

This review did not compare the effects of specific combinations of psychiatric rehabilitation methods on outcomes (e.g. a combination of psychoeducation, cognitive remediation and social skills training on social skills), and this must be considered a limitation. This evaluation was beyond the aim of this scoping review. We recommend a more detailed review analysing and comparing specific combinations of interventions on specific outcomes to be conducted. However, the authors want to point out that comparisons might be difficult to administer, in regard to the small number of studies on the same combinations of psychiatric rehabilitation interventions and varying outcomes analysed in studies.

CONCLUSION

Some studies on combinations of psychiatric rehabilitation interventions have been conducted, and combinations of interventions may be effective on different outcomes. However, more studies are needed. Comprehensive psychiatric intervention should include different appropriate evidence-based methods, a coherent and continuous working relationship and meaningful wholeness of continuity of services. In this kind of service environment persons with SMI could be responsive to the interventions offered and see possibilities for their recovery.

Supplementary Material

Supplementary data are available at [Psychiatrica Fennica online]().

Funding

Author J.T. has a working grant from Eemil Aaltonen Foundation (grant number 240211). Other authors none. Benefactors had no part in designing or conducting this review.

CRediT authorship contribution statement

Jonna Tolonen: Conceptualization, Methodology, Data curation, Investigation, Formal analysis, Visualization, Resources, Writing – Original draft and review & editing, Project administration Krista Hylkilä: Methodology, Investigation, Formal analysis, Validation, Writing – Original draft and review & editing Liisa Kiviniemi: Conceptualization, Investigation, Formal analysis, Writing – Original draft and review & editing Kristiina Moilanen: Conceptualization, Writing – Review & editing Boris Karpov: Writing – Review & editing Erika Jääskeläinen: Conceptualization, Writing –Review & editing, Supervision

Declaration of competing interests

The authors declare no conflicts of interests.

Acknowledgements

Authors want to give a warm thank you to knowledge users for their participation in consultation. Additionally, authors wish to thank information specialist Sirpa Grekula from university of Oulu for assistance in literature search.

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