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# Psychosocial interventions for community-dwelling individuals with schizophrenia: study design and rationale for a systematic review and meta-analysis



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## TITLE

Psychosocial interventions for community-dwelling individuals with schizophrenia: study design and rationale for a systematic review and meta-analysis

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## ABSTRACT

**Introduction:** Despite the recent global mental health movement of the transition from hospital-centred to integrated community-based services, comprehensive evidence of psychosocial interventions focusing on community-dwelling individuals with schizophrenia is still lacking. To overcome this gap in the current knowledge, we will conduct a systematic review and meta-analysis to assess the efficacy of all types of psychosocial interventions for community-dwelling (non-hospitalised) individuals with schizophrenia when compared to non-active control conditions (e.g. treatment as usual).

**Methods and analysis:** This study protocol has been developed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines. The following sources will be searched without restrictions for language or publication period: Embase, PubMed, PsycINFO, CINAHL, the Cochrane Central Register of Controlled Trials (CENTRAL), ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform (ICTRP). We will also try to identify other potentially eligible studies by searching the reference lists of included studies, other relevant systematic reviews, and grey literature. All relevant randomised controlled trials from both high-income and low to middle-income countries will be allowed. Two independent reviewers will conduct the selection/screening of studies, data extraction, and methodological quality assessment of included studies. Disagreements/discrepancies between reviewers will be resolved through discussion. The primary outcomes are quality of life and psychiatric hospital admission. Standard pairwise meta-analyses with a random-effects model will be conducted. Subgroup and sensitivity analyses will be performed to assess the robustness of the findings. The Grades of Recommendation Assessment, Development and Evaluation (GRADE) approach will be used to assess the quality of evidence.

**Ethics and dissemination:** Ethics approval is not required for this study. The study findings will be disseminated through conference presentations as well as peer-reviewed publications.

**PROSPERO registration number:** CRD42021266187

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- To the best of our knowledge, this proposed systematic review and meta-analysis will be the first to focus on the efficacy of all types of psychosocial interventions for community-dwelling individuals with schizophrenia and related disorders, irrespective of income levels in countries.
- This study will only include relevant randomised controlled trials in order to avoid sources of bias that are commonly seen in quasi-experimental clinical trials, particularly when employing pre–post study design without control groups.
- This study will accept all relevant trials from both high-income and low to middle-income countries, without placing restrictions on language of publication.
- The main strengths listed above will make the study findings applicable to a wide range of countries, have the potential to inform and influence clinical decision-making, and serve as a guide for planning meaningful mental healthcare resource allocation.
- Findings of this study may be limited by publication bias, study heterogeneity, the measurements used to assess quality of life (primary outcome), and the methodological quality of included studies.

## INTRODUCTION

Schizophrenia is one of the most painful and costliest mental disorders, not only for individuals and their families but also for wider society. The psychopathology of schizophrenia is characterised by persistent positive symptoms (e.g. delusions and hallucinations), negative symptoms (e.g. impaired motivation, reduction in spontaneous speech), and cognitive/functional impairment.[1] Globally, schizophrenia is generally regarded as a low prevalence mental disorder (the global age-standardised point prevalence is 0.28%), but it creates a considerable economic deficit to society due to losses in productivity by individuals, costs for treatment, and significant burdens on health and welfare systems.[2, 3]

Although antipsychotic medication is a global-standard effective treatment option for treating/managing psychotic symptoms (especially for positive symptoms),[4] a previous study reported that 27% of individuals who had been treated with antipsychotics experienced a psychotic relapse within one year.[5] Furthermore, antipsychotics are of less benefit, especially for negative symptoms, cognitive deficits, and psychosocial functioning.[6-8] In line with this, to assist in promoting recovery, there is consensus that treatment for schizophrenia should offer a full range of pharmacological and psychosocial interventions (including social and occupational interventions).[9] Furthermore, in many countries (especially economically developed countries), mental health services have been transformed from hospital-centred to integrated community-based services by reducing the size of hospitals (e.g. the number of hospital beds) and developing community-based services. Thus, effective psychosocial interventions for community-dwelling individuals with schizophrenia are in high demand around the world.

Based on systematic reviews and meta-analyses of randomised controlled trials, there is now an increasing body of evidence concerning the efficacy of a range of psychosocial interventions for schizophrenia (mostly on positive symptoms and relapse prevention), such as psychoeducation,[10] social skills training,[11] cognitive behavioural therapy,[12-14] family intervention,[15] and assertive community treatment.[16] A recent network meta-analysis has evaluated the efficacy of psychological interventions for positive symptoms in schizophrenia, and has found higher efficacy for cognitive behavioural therapy in comparison with an inactive control condition for positive symptoms and

treatment response.[17] However, most of the meta-analyses did not consider the type of intervention setting/context (i.e. efficacy of psychosocial interventions conducted in the inpatient and outpatient settings were combined/complex). Some of the studies have performed subgroup or sensitivity analyses according to intervention setting, but most compared or stratified intervention settings in these studies were hospital-based (i.e. inpatient vs outpatient settings).[18-22] One meta-analysis[23] investigated the efficacy of community-based psychosocial interventions for schizophrenia, but this study only focused on low and middle-income countries where there are severe shortages of mental healthcare resources (i.e. limited available facilities and healthcare professionals).[24]

To summarise, despite the recent global mental health movement of the transition from hospital-centred to integrated community-based services, comprehensive evidence of psychosocial interventions focusing on community-dwelling individuals with schizophrenia is still lacking. To overcome this gap in the current knowledge, we will perform a systematic review and meta-analysis to assess the efficacy of all types of psychosocial interventions for community-dwelling individuals with schizophrenia when compared to non-active control conditions (e.g. treatment as usual, waiting list). We are specifically interested in community-based psychosocial interventions, but it is difficult to define "community-based" or "community-setting" because healthcare/welfare systems and available facilities/services are widely varied across countries. Thus, we decided to focus only on psychosocial interventions that target community-dwelling individuals with schizophrenia (e.g. outpatient, day-care, outreach settings), and that cover all intervention settings/contexts except inpatient settings. We will allow studies from both high-income and low to middle-income countries. A better understanding of the meta-analytic efficacy of these psychosocial interventions would be important for clinical practice and for planning meaningful mental healthcare resource allocation.

## METHODS AND ANALYSIS

This systematic review and meta-analysis has been developed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines,[25] and the study protocol has been registered with the International Prospective Register of Systematic Reviews

(PROSPERO) (registration number: CRD42021266187). The PROSPERO record will be updated with any amendments/revisions made.

**Types of studies**

All relevant randomised controlled trials (RCTs), including cluster RCTs, will be included. We will accept open and blinded RCTs. This choice is particularly relevant in trials on psychosocial interventions, in which only the outcome assessor can be blind, but not the providers or participants (i.e. Prospective Randomised Open, Blinded End-point [PROBE] trials). In the case of cross-over studies, we will use only the first cross-over phase. Where people are given additional treatments as well as psychosocial intervention plus standard care, we will only include data if the adjunct treatment is evenly distributed between groups and it is only the psychosocial intervention that is randomized. We will include studies from both high-income and low to middle-income countries.

**Types of participants**

Community-dwelling individuals aged 18 years or older with a primary diagnosis of schizophrenia or related disorders, including schizophreniform disorder, schizoaffective disorder, and delusional disorder, will be considered. Any version of the International Classification of Diseases (ICD), Diagnostic and Statistical Manual of Mental Disorders (DSM), Research Diagnostic Criteria (RDC), Feighner criteria, as well as clinical judgment are accepted.

We will not include participants deemed to be "at-risk" of developing schizophrenia, and who have a developmental impairment, intellectual disability, or organic psychosis. Studies including participants diagnosed with other mental disorders will be included only if (a) data on participants with a diagnosis of schizophrenia or related disorders can be extracted separately, or (b) participants with a diagnosis of schizophrenia or related disorders constitute more than 80% of the participants in each arm.

**Types of interventions**

We will include any psychosocial intervention as long as it targets community-dwelling (i.e. non-hospitalised) individuals with schizophrenia and related disorders. Psychosocial interventions are defined as any structured intervention focusing on individuals' psychological and/or social factors as opposed to biological factors (e.g. pharmacological intervention). We expect to include specific psychotherapies (e.g. cognitive behavioural therapy, metacognitive training), non-specific psychotherapies (e.g. psychoeducation, supportive therapy), group psychotherapies (e.g. family intervention), interventions focusing on psychosocial functioning (e.g. supported employment/vocational rehabilitation, social skills training), and interventions including the broader context in which the individual lives (e.g. assertive community treatment). The interventions mentioned above are typical examples. If during the screening process we identify studies meeting inclusion criteria that examine other psychosocial interventions, we will include them.

Interventions could be implemented through a range of modes (e.g. face-to-face, telephone, internet-delivered). Psychosocial interventions may also target just individuals with schizophrenia, or schizophrenic individuals and their partners/family members. Unguided self-help interventions at home (e.g. self-help books, online self-help programmes) will also be allowed. Interventions that take place in inpatient settings will be excluded. Interventions that take place in both inpatient and other settings will be included only if the interventions that take place outside of inpatient settings constitute more than 80% of the total sessions or the intervention period. We will accept any co-intervention to psychosocial intervention only if there is a comparison group that received the co-intervention alone. No limit is set for the study duration or number of sessions provided in an intervention.

**Types of comparators**

Comparators (i.e. control conditions) will include non-active/no additional intervention (e.g. treatment as usual), waiting list, and other non-active interventions (e.g. psychological placebo). When treatment as usual is used as a waiting list, we will classify this condition as a waiting list. Co-intervention alone will be classified as no additional intervention.

**Types of outcome measures**

Primary outcomes

1. Quality of life, as measured using a validated clinical instrument (e.g. the World Health Organisation Quality-of-Life Scale, the Medical Outcomes Study Short-Form, EuroQoL, the Centers for Disease Control and Prevention Health-Related Quality of Life, the Flanagan's Quality of Life Scale, Heinrich's Quality of Life Scale, the McGill Quality of Life Questionnaire)
2. Proportion of psychiatric hospital admission

Primary outcomes will be divided into short-term (six months or less), medium-term (seven to 12 months), and long-term (over 12 months). If multiple time points are given, we will use those points closest to six months (for short-term: primary time point), 12 months (for medium-term), and 24 months (for long-term).

Secondary outcomes

1. Personal recovery, as measured using a validated clinical instrument (e.g. the Recovery Assessment Scale, the Questionnaire about the Process of Recovery)
2. Overall functioning, as measured using a validated clinical instrument (e.g. the Global Assessment of Functioning, the Psychosocial Performance Scale).
3. Overall psychotic symptoms, as measured using a validated clinical instrument (e.g. the Positive and Negative Syndrome Scale, the Brief Psychiatric Rating Scale).
4. Positive symptoms, as measured using a validated clinical instrument (e.g. the Positive and Negative Syndrome Scale [positive symptom subscale], the Brief Psychiatric Rating Scale [positive symptom subscale], the Scales for Assessment of Positive Symptoms).
5. Negative symptoms, as measured using a validated clinical instrument (e.g. the Positive and Negative Syndrome Scale [negative symptom subscale], the Brief Psychiatric Rating Scale [negative symptom subscale], the Scales for Assessment of Negative Symptoms).
6. Tolerability, defined as the proportion of participants experiencing severe adverse events (e.g. deaths, attempts at suicide, suicide ideation, serious violent incidents).

7. Acceptability, defined as the proportion of premature discontinuation (dropout rate) for any reason.

For secondary outcomes, we will use outcomes collected at the given endpoint of each study. If multiple time points are set, we will use those points that are six months or less and the closest to six months.

**Search strategy**

The following sources will be searched without restrictions for language or publication period: Embase, PubMed, PsycINFO, CINAHL, the Cochrane Central Register of Controlled Trials (CENTRAL), ClinicalTrials.gov, and World Health Organisation International Clinical Trials Registry Platform (ICTRP). An example of a search strategy for PubMed is presented in Table 1. The date of the last search update will be provided in the final publication.

We will also try to identify other potentially eligible studies or ancillary publications by searching the reference lists of included studies, other relevant systematic reviews, and grey literature.

**Table 1**. An example of a search strategy for PubMed.

| Search number | Query |
|---|---|
| #1 | "schizophrenia spectrum and other psychotic disorders"[MeSH Terms] OR "schizo*"[Title/Abstract] OR "psychotic*"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "psychoses"[Title/Abstract] |
| #2 | "psychotherapy"[MeSH Terms] OR "psychoanalysis"[MeSH Terms] OR "counseling"[MeSH Terms] OR "community mental health services"[Mesh Terms] OR "psychiatric rehabilitation"[Mesh Terms] OR "acceptance and commitment therap*"[Title/Abstract] OR "assertive communit*"[Title/Abstract] OR "behavior modificat*"[Title/Abstract] OR "behavior regulat*"[Title/Abstract] OR "behavior therap*"[Title/Abstract] OR "behaviour modificat*"[Title/Abstract] OR "behaviour regulat*"[Title/Abstract] OR "behaviour therap*"[Title/Abstract] OR "behavioral modificat*"[Title/Abstract] OR "behavioral regulat*"[Title/Abstract] OR "behavioral therap*"[Title/Abstract] OR "behavioural modificat*"[Title/Abstract] OR "behavioural |

| | |
|---|---|
| | regulat*"[Title/Abstract] OR "behavioural therap*"[Title/Abstract] OR "cognitive behavio*"[Title/Abstract] OR "cognitive intervent*"[Title/Abstract] OR "cognitive rehabilitat*"[Title/Abstract] OR "cognitive remediat*"[Title/Abstract] OR "cognitive technique*"[Title/Abstract] OR "cognitive therap*"[Title/Abstract] OR "cognitive treatment*"[Title/Abstract] OR "compassion focused"[Title/Abstract] OR "conversational therap*"[Title/Abstract] OR "conversion therap*"[Title/Abstract] OR "counseling"[Title/Abstract] OR "counselling"[Title/Abstract] OR "emotion focused"[Title/Abstract] OR "emotionally focused"[Title/Abstract] OR "emotional focused"[Title/Abstract] OR "exposure therap*"[Title/Abstract] OR "family intervent*"[Title/Abstract] OR "family therap*"[Title/Abstract] OR "group intervent*"[Title/Abstract] OR "group therap*"[Title/Abstract] OR "meditation"[Title/Abstract] OR "metacognitive therap*"[Title/Abstract] OR "metacognitive training"[Title/Abstract] OR "meta-cognitive therap*"[Title/Abstract] OR "meta-cognitive training"[Title/Abstract] or "mindfulness"[Title/Abstract] OR "morita therap*"[Title/Abstract] OR "narrative therap*"[Title/Abstract] OR "problem solv*"[Title/Abstract] OR "psychoanaly*"[Title/Abstract] OR "psychodynamic*"[Title/Abstract] OR "psychoeducat*"[Title/Abstract] OR "psychological treatment*"[Title/Abstract] OR "psychological intervent*"[Title/Abstract] OR "psychosocial treatment*"[Title/Abstract] OR "psychosocial intervent*"[Title/Abstract] OR "psychotherap*"[Title/Abstract] OR "socioenvironmental therap*"[Title/Abstract] OR "social skills training*"[Title/Abstract] OR "supportive therap*"[Title/Abstract] OR "psychiatric rehabili*"[Title/Abstract] or "psychosocial rehabili*"[Title/Abstract] |
| #3 | "randomized controlled trials as topic"[MeSH Terms] OR "controlled clinical trial"[Publication Type] OR "random*"[Title/Abstract] OR "RCT"[Title/Abstract] or "control*"[Title/Abstract] OR "trial*"[Title/Abstract] OR "condition*"[Title/Abstract] |
| #4 | #1 AND #2 AND #3 |
| #5 | #4 NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms]) |

**Screening and data extraction**

Screening

All search results will be catalogued using EndNote. After removing duplicates, screening and selection of studies will be managed using Rayyan. Eligibility of each study will be determined with

the aid of a two-step screening procedure. First, screening of titles and abstracts will be conducted. Second, full-text screening of studies selected in the first screening will be performed. Both the first and second screening will be performed by two independent, blinded reviewers. We will include studies that both reviewers judge to be "included". Prior to the formal screening, our review team will work together to screen a small sample of studies to ensure accuracy and consistency among reviewers. If both reviewers disagree even after discussion, we will consult another reviewer to make a decision. If there are any uncertainties about eligibility for this study, we will ask the authors of the original studies to provide further information. Details of selection process will be presented in the PRISMA flow chart.

Data extraction

Two reviewers will independently extract data from each selected study using a pre-designed form in Microsoft Excel. The following data will be extracted from each included study:

- Publication information: authors name, publication year
- Study characteristics: country in which the study was conducted, study design (type of RCT), number of arms, number randomised to each arm, randomisation method
- Participant demographics: mean age, proportion of female/male, proportion of ethnicity, proportion of first-episode cases, details on diagnosis, method of diagnostic assessment
- Intervention/comparator characteristics: type of intervention (e.g. social skills training, cognitive behavioural therapy), setting/context (outpatient clinic, other facilities, home, or combination), format (individual, group, or combination), intensity and type of contact/support (therapist-led, self-help [no contact/support], or combination; face-to-face, remote [e.g. telephone, e-mail, internet], or combination), inclusion of intervention for partners/family members, expertise of therapist (e.g. doctor, nurse, psychologist), intervention dose (number and frequency of sessions/contacts, time span of the intervention), type of comparator (non-active intervention [e.g. treatment as usual], waiting list, or other non-active interventions [e.g. psychological/pill placebo])

- Outcome measures: primary and secondary outcomes specified and collected, method of collection (self-reported or assessor-rated), and time points reported
- Others: potential conflicts of interest and funding agencies

Before extracting data, a calibration exercise will be undertaken to ensure accuracy and consistency among reviewers. If there is any discrepancy between reviewers even after discussion, we will consult another reviewer in order to reach consensus. If needed, we will ask study authors to obtain additional data and/or further clarification.

**Risk of bias assessment**

The risk of bias for the included studies will be assessed with Revised Cochrane Risk-of-Bias Tool for Randomized Trials (RoB 2). Two reviewers will independently assess the following bias domains:

- Bias arising from the randomisation process
- Bias due to deviations from intended interventions
- Bias due to missing outcome data
- Bias in measurement of the outcome
- Bias in selection of the reported result
- Other biases.

Assessments will be classified into three levels according to the quality classification standards: low risk, some concerns, and high risk of bias. Any disagreements/discrepancies will be resolved through discussion. If necessary, we will contact the study authors for further information. Effects of studies with a high risk of bias in the overall domain will be evaluated by sensitivity analyses.

**Strategy for data synthesis and statistical analysis**

***Characteristics of the included studies***

We will produce descriptive statistics and study population characteristics across all included studies, describing the types of comparisons and other clinical or methodological variables mentioned above.

***Measurement of intervention effect***

The extracted data will be synthesised into a meta-analysis where possible. We will perform standard pairwise meta-analyses with a random-effects model for every comparison with at least two studies. Statistical analysis will be carried out using the Cochrane Collaboration's Review Manager (RevMan) software (version 5.4 for Windows). Heterogeneity is anticipated due to variations in psychological interventions in the included studies, participant characteristics, and methodological factors; therefore, a random-effects model will be used. For continuous outcomes (quality of life, personal recovery, overall functioning, overall psychotic symptoms, and positive/negative symptoms), standardised mean differences with 95% confidence intervals (CIs) will be calculated. For dichotomous outcomes (e.g. hospital admission, severe adverse events, and premature discontinuation), risk ratios with 95% CIs will be calculated. The data for each meta-analysis will be presented in a forest plot.

***Dealing with missing data***

We will assess levels of attrition for included studies, and conduct sensitivity analysis of the impact of including studies with missing data of 20% or more. For all outcomes, we will conduct intention-to-treat analysis wherever possible.

***Assessment of heterogeneity***

Heterogeneity will be evaluated by using the inconsistency index ($I^2$) statistic to describe the percentages of total variation across studies ($I^2 \leq 50\%$ = low; $I^2 > 50\%$ = moderate to high). Where appropriate for pooling effect sizes, a fixed-effects model will be used when heterogeneity is low, and a random-effects model will be used when heterogeneity is moderate to high. If any substantial heterogeneity is observed, we will perform further subgroup analysis.

***Assessment of publication bias***

If a sufficient number of studies (10 or more) are eligible for meta-analysis, funnel plots will be used to assess reporting bias.

***Analysis of subgroups or subsets***

If any substantial heterogeneity is identified, the following potential effect moderators of primary outcomes will be explored by subgroup analyses:

- Type of intervention
- Intervention setting/context (facility-based [e.g. outpatient clinic] versus others [e.g. home])
- Intervention format (individual versus group)
- Intensity of contact/support (therapist-led versus self-help [no contact/support])
- Country categories (high-income versus low to middle-income countries [based on World Bank income group])

If possible, we will perform some extra subgroup analyses according to the results of heterogeneity and inconsistency. Subgroup differences will be assessed by interaction tests. The results of subgroup analyses will be reported quoting the $I^2$ statistic and p value, and the interaction test $I^2$ value.

We also plan to perform sensitivity analysis on primary outcomes to observe the effects of excluding studies with high risk of bias in the overall domain.

***Assessment of the confidence in cumulative evidence***

The Grades of Recommendation Assessment, Development and Evaluation (GRADE) approach will be used to rate the overall evidence. Data will be imported from RevMan to the GRADE profiler (GRADEpro) software to produce "summary of findings" tables. These tables will provide key information regarding evidence quality, intervention effect, and a summary of available data on the outcome variables. The quality of the body of evidence will be assessed based on five factors: study limitations, consistency of effect, imprecision, indirectness, and publication bias. Assessments will be judged/categorised as "high", "moderate", "low", and "very low".

## ETHICS AND DISSEMINATION

This study will consist of secondary analyses of existing anonymous data (i.e. primary data will not be collected); hence, no formal ethical review/assessment is required. We plan to disseminate the study findings through conference presentations as well as publications in peer-reviewed journals.

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**Authors' contributions**: YS, HT, HI, and NY designed the study protocol, and drafted the manuscript. HN, FY, TG, YK, AT, HS, and YI contributed with clinical and methodological input in planning the protocol. All authors critically revised the draft and contributed to and have approved the final manuscript.

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**Competing interests statement**: HI has received consulting fees from Mitsubishi-Tanabe Pharma; honoraria for lectures from Mochida Pharmaceutical, Otsuka Pharmaceutical, and Kyowa Pharmaceutical. TG has received honorarium for writing from Igaku-Shoin. AT has received honoraria for lectures from Mitsubishi-Tanabe Pharma, Sumitomo Dainippon Pharma, and Otsuka Pharmaceutical. HS has received honoraria for lectures/presentations from Pfizer, Sanofi, Alexion Pharmaceuticals, Novo Nordisk Pharma, Sumitomo Dainippon Pharma, JCR Pharmaceuticals, Miyazaki City and Country Medical Association, Children's Cancer Association of Japan, and Miyazaki Health Promotion Association; payment for expert testimony from Kyushu Conference for School Physical Examination, Miyazaki City and Country Medical Association, and Miyazaki Prefectural Health Foundation; he is a leader of Committee for Growth Charts at School of Miyazaki City and Country Medical Association, and Specialist Committee on Newborn Screening Tests of Miyazaki Prefectural Health Foundation. YI has received contracts from Tsumura; honoraria for lectures from Otsuka Pharmaceutical, Sumitomo Dainippon Pharma, Meiji Seika Pharma, Tsumura, Yoshitomiyakuhin Corporation, Takeda Pharmaceutical, Eisai, Mochida Pharmaceutical, Kyowa Kirin, MSD, and Towa Pharmaceutical. NY has received a book royalty from Medical Friend; honoraria for lectures from Gakken Medical Support, Eisai, Meiji Seika Pharma, Mitsubishi-Tanabe Pharma, and Mochida Pharmaceutical; honoraria for writings from Igaku-Shoin, Nikkei Business Publications, and Maruzen Publishing; he is a Diplomate of the Academy of Cognitive and Behavioral

Therapies, Secretary Board Member of the Japanese Association for Cognitive Therapy, and Member of the Japan Clinical Guideline Development Group for Anxiety Disorders and Obsessive-Compulsive Disorder. All of the other authors declare that they have no competing interests.

**Patient consent for publication**: Not required.

**Patient and public involvement statement**: Neither patients nor the public was involved in the design, conduct, reporting, or dissemination plans of this study.

**Provenance and peer review**: Not commissioned; externally peer reviewed.

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**PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol***

| Section and topic | Item No | Checklist item | Information reported |
|---|---|---|---|
| **ADMINISTRATIVE INFORMATION** | | | |
| Title: | | | |
| Identification | 1a | Identify the report as a protocol of a systematic review | Yes |
| Update | 1b | If the protocol is for an update of a previous systematic review, identify as such | N/A |
| Registration | 2 | If registered, provide the name of the registry (such as PROSPERO) and registration number | Yes |
| Authors: | | | |
| Contact | 3a | Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author | Yes |
| Contributions | 3b | Describe contributions of protocol authors and identify the guarantor of the review | Yes |
| Amendments | 4 | If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments | Yes |
| Support: | | | |
| Sources | 5a | Indicate sources of financial or other support for the review | Yes |
| Sponsor | 5b | Provide name for the review funder and/or sponsor | Yes |
| Role of sponsor or funder | 5c | Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol | Yes |
| **INTRODUCTION** | | | |
| Rationale | 6 | Describe the rationale for the review in the context of what is already known | Yes |
| Objectives | 7 | Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) | Yes |
| **METHODS** | | | |
| Eligibility criteria | 8 | Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review | Yes |
| Information sources | 9 | Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage | Yes |
| Search strategy | 10 | Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be | Yes |

| | | | |
|---|---|---|---|
| | | repeated | |
| Study records: | | | Yes |
| Data management | 11a | Describe the mechanism(s) that will be used to manage records and data throughout the review | Yes |
| Selection process | 11b | State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis) | Yes |
| Data collection process | 11c | Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators | Yes |
| Data items | 12 | List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications | Yes |
| Outcomes and prioritization | 13 | List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale | Yes |
| Risk of bias in individual studies | 14 | Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis | Yes |
| Data synthesis | 15a | Describe criteria under which study data will be quantitatively synthesised | Yes |
| | 15b | If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as $I^2$, Kendall's $\tau$) | Yes |
| | 15c | Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression) | Yes |
| | 15d | If quantitative synthesis is not appropriate, describe the type of summary planned | |
| Meta-bias(es) | 16 | Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies) | Yes |
| Confidence in cumulative evidence | 17 | Describe how the strength of the body of evidence will be assessed (such as GRADE) | Yes |

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

*From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.*

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# Psychosocial interventions for community-dwelling individuals with schizophrenia: study protocol for a systematic review and meta-analysis

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| | |

## TITLE

Psychosocial interventions for community-dwelling individuals with schizophrenia: study protocol for a systematic review and meta-analysis


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## ABSTRACT

**Introduction:** Despite the recent global mental health movement of the transition from hospital-centred to integrated community-based services, comprehensive evidence of psychosocial interventions focusing on community-dwelling individuals with schizophrenia is still lacking. To overcome this gap in the current knowledge, we will conduct a systematic review and meta-analysis to assess the efficacy of all types of psychosocial interventions for community-dwelling (non-hospitalised) individuals with schizophrenia when compared to non-active control conditions (e.g. treatment as usual).

**Methods and analysis:** This study protocol has been developed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols guidelines. By March 2022, the following sources will have been searched, without restrictions for language or publication period: Embase, PubMed, PsycINFO, CINAHL, the Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform. We will also try to identify other potentially eligible studies by searching the reference lists of included studies, other relevant systematic reviews, and grey literature. All relevant randomised controlled trials from both high-income and low to middle-income countries will be allowed. Two independent reviewers will conduct the selection/screening of studies, data extraction, and methodological quality assessment of included studies. The primary outcomes are quality of life and psychiatric hospital admission. Standard pairwise meta-analyses with a random-effects model will be conducted. Subgroup and sensitivity analyses will be performed to assess the robustness of the findings. Risk of bias will be assessed with the Revised Cochrane Risk-of-Bias Tool for Randomised Trials. The Grades of Recommendation Assessment, Development and Evaluation approach will be used to assess the quality of evidence.

**Ethics and dissemination:** Ethics approval is not required for this study. The study findings will be disseminated through conference presentations as well as peer-reviewed publications.

**PROSPERO registration number:** CRD42021266187

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study will only include relevant randomised controlled trials in order to avoid sources of bias that are commonly seen in quasi-experimental clinical trials.
- This study will accept all relevant trials from both high-income and low to middle-income countries, without placing restrictions on language of publication.
- Findings of this study may be limited by publication bias, study heterogeneity, the measurements used to assess quality of life (primary outcome), and the methodological quality of included studies.

## INTRODUCTION

Schizophrenia is one of the most painful and costliest mental disorders, not only for individuals and their families but also for wider society. Schizophrenia and related disorders are usually diagnosed based on the presence of positive and/or negative symptoms, and functional impairment.[1] Positive symptoms include psychotic manifestations, such as hallucinations, delusions, disorganized thought and speech, and disorganized/catatonic behaviour. Negative symptoms include blunted affect, alogia, anhedonia, asociality, and avolition.[2] The accumulating evidence suggests that negative symptoms have more impact on everyday functioning and quality of life than positive and other symptom factors.[3, 4] Globally, schizophrenia is generally regarded as a low prevalence mental disorder (the global age-standardised point prevalence is 0.28%), but it creates a considerable economic deficit to society due to losses in productivity by individuals, costs for treatment, and significant burdens on health and welfare systems.[5, 6]

Although antipsychotic medication is a global-standard effective treatment option for treating/managing psychotic symptoms (especially for positive symptoms),[7] 20–30% of people with schizophrenia are resistant to antipsychotics,[8] and 27% of individuals who had been treated with antipsychotics experienced a psychotic relapse within one year.[9] Furthermore, antipsychotics are of less benefit for negative symptoms.[10] However, limited evidence has suggested that psychosocial interventions are effective for managing treatment-resistant schizophrenia,[11] and for ameliorating negative symptoms.[12] In this context, to assist in promoting recovery, there is consensus that treatment for schizophrenia should offer a full range of pharmacological and psychosocial interventions (including social and occupational interventions).[13] Furthermore, in many countries (especially economically developed countries), mental health services have been transformed from hospital-centred to integrated community-based services by reducing the size of hospitals (e.g. the number of hospital beds) and developing community-based services. Thus, effective psychosocial interventions for community-dwelling individuals with schizophrenia are in high demand around the world.

Based on systematic reviews and meta-analyses of randomised controlled trials, there is now an increasing body of evidence concerning the efficacy of a range of psychosocial interventions for

schizophrenia (mostly on positive symptoms and relapse prevention), such as psychoeducation,[14] social skills training,[15] cognitive behavioural therapy,[16-18] family intervention,[19] and assertive community treatment.[20] A recent network meta-analysis has evaluated the efficacy of psychological interventions for positive symptoms in schizophrenia, and has found higher efficacy for cognitive behavioural therapy in comparison with an inactive control condition for positive symptoms and treatment response.[21] McDonagh and colleagues have also conducted an updated systematic review, based on existing systematic reviews and additional trials, and reported that most psychosocial interventions for adults with schizophrenia were more effective in improving several outcomes (e.g. functional outcomes, quality of life, and core illness symptoms) when compared to treatment as usual.[22] However, most of the systematic reviews and meta-analyses did not consider the type of intervention setting/context (i.e. efficacy of psychosocial interventions conducted in the inpatient and outpatient settings were combined/complex). Some of the studies have performed subgroup or sensitivity analyses according to intervention setting, but most compared or stratified intervention settings in these studies were hospital-based (i.e. inpatient vs outpatient settings).[23-27] One meta-analysis[28] investigated the efficacy of community-based psychosocial interventions for schizophrenia, but this study only focused on low and middle-income countries where there are severe shortages of mental healthcare resources (i.e. limited available facilities and healthcare professionals).[29]

To summarise, despite the recent global mental health movement of the transition from hospital-centred to integrated community-based services, comprehensive evidence of psychosocial interventions focusing on community-dwelling individuals with schizophrenia is still lacking. To overcome this gap in the current knowledge, we will perform a systematic review and meta-analysis to assess the efficacy of all types of psychosocial interventions for community-dwelling individuals with schizophrenia when compared to non-active control conditions (e.g. treatment as usual, waiting list). We are specifically interested in community-based psychosocial interventions, but it is difficult to define “community-based” or “community-setting” because healthcare/welfare systems and available facilities/services are widely varied across countries. Thus, we decided to focus only on psychosocial interventions that target community-dwelling individuals with schizophrenia (e.g.

outpatient, day-care, outreach settings), and that cover all intervention settings/contexts except inpatient settings. We will allow studies from both high-income and low to middle-income countries. A better understanding of the meta-analytic efficacy of these psychosocial interventions would be important for clinical practice and for planning meaningful mental healthcare resource allocation.

## METHODS AND ANALYSIS

This systematic review and meta-analysis has been developed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines,[30] and the study protocol has been registered with the International Prospective Register of Systematic Reviews (PROSPERO) (registration number: CRD42021266187). The PROSPERO record will be updated with any amendments/revisions made.

### Types of studies

All relevant randomised controlled trials (RCTs), including cluster RCTs, will be included. We will accept open and blinded RCTs. This choice is particularly relevant in trials on psychosocial interventions, in which only the outcome assessor can be blind, but not the providers or participants (i.e. Prospective Randomised Open, Blinded End-point [PROBE] trials). In the case of cross-over studies, we will use only the first cross-over phase. Where people are given additional treatments as well as psychosocial intervention plus standard care, we will only include data if the adjunct treatment is evenly distributed between groups and it is only the psychosocial intervention that is randomised. We will include studies from both high-income and low to middle-income countries.

### Types of participants

Community-dwelling individuals aged 18 years or older with a primary diagnosis of schizophrenia or related disorders, including schizophreniform disorder, schizoaffective disorder, and delusional disorder, will be considered. Any version of the International Classification of Diseases (ICD), Diagnostic and Statistical Manual of Mental Disorders (DSM), Research Diagnostic Criteria (RDC), Feighner criteria, as well as clinical judgment are accepted.

We will not include participants deemed to be "at-risk" of developing schizophrenia, and who have a developmental impairment, intellectual disability, or organic psychosis. Studies including participants diagnosed with other mental disorders will be included only if (a) data on participants with a diagnosis of schizophrenia or related disorders can be extracted separately, or (b) participants with a diagnosis of schizophrenia or related disorders constitute more than 80% of the participants in each arm.

**Types of interventions**

We will include any psychosocial intervention as long as it targets community-dwelling (i.e. non-hospitalised) individuals with schizophrenia and related disorders. Psychosocial interventions are defined as any structured intervention focusing on individuals' psychological and/or social factors as opposed to biological factors (e.g. pharmacological intervention). We expect to include specific psychotherapies (e.g. cognitive behavioural therapy, metacognitive training), non-specific psychotherapies (e.g. psychoeducation, supportive therapy), group psychotherapies (e.g. family intervention), interventions focusing on psychosocial functioning (e.g. supported employment/vocational rehabilitation, social skills training), and interventions including the broader context in which the individual lives (e.g. assertive community treatment). The interventions mentioned above are typical examples. If during the screening process we identify studies meeting inclusion criteria that examine other psychosocial interventions, we will include them.

Interventions could be implemented through a range of modes (e.g. face-to-face, telephone, internet-delivered). Psychosocial interventions may also target just individuals with schizophrenia, or schizophrenic individuals and their partners/family members. Unguided self-help interventions at home (e.g. self-help books, online self-help programmes) will also be allowed. Interventions that take place in inpatient settings will be excluded. Interventions that take place in both inpatient and other settings will be included only if the interventions that take place outside of inpatient settings constitute more than 80% of the total sessions or the intervention period. We will accept any co-intervention to psychosocial intervention only if there is a comparison group that received the co-intervention alone. No limit is set for the study duration or number of sessions provided in an intervention.

**Types of comparators**

Comparators (i.e. control conditions) will include treatment as usual, waiting list, as well as non-active interventions (e.g. psychological placebo). As for psychological placebo, it is regarded as those interventions intended to control for non-specific aspects of the intervention by the researchers (e.g. befriending, recreation and support, social activity therapy, supportive counselling). When treatment as usual is used as a waiting list, we will classify this condition as a waiting list. Co-intervention alone will be classified as treatment as usual.

**Types of outcome measures**

We set our key outcome measures for community-dwelling individuals with schizophrenia in our review based on the standard set of outcomes for psychotic disorders, defined by an international group of leading psychiatrists, psychologists, mental health experts, measurement experts, and lived experience experts (International Consortium for Health Outcomes Measurement: ICHOM).[31]

The belief that "recovery" is a key concept in mental health policy is now gaining wide acceptance around the world. In the ICHOM's standard set of outcomes for psychotic disorders,[31] the domain of "recovery" consists of two key outcomes: quality of life and personal recovery. Among these two outcomes, we set quality of life as a primary outcome, and personal recovery as a secondary outcome because: (1) quantitative research assessing personal recovery is rapidly increasing, but a limited number of intervention studies are available that used personal recovery as an outcome measure;[32-34] and (2) quality of life is the most strongly associated enabling factor for personal recovery.[35]

Primary outcomes

1. Quality of life, as measured using a validated clinical instrument (e.g. the World Health Organisation Quality-of-Life Scale, the Medical Outcomes Study Short-Form, EuroQoL, the Centers for Disease Control and Prevention Health-Related Quality of Life, the Flanagan's Quality of Life Scale, Heinrich's Quality of Life Scale, the McGill Quality of

Life Questionnaire). If an identified study does not measure quality of life, we will use a validated clinical instrument measuring "well-being", which has closely related constructs with quality of life (e.g. the World Health Organization Well-Being Index, Warwick-Edinburgh Mental Well-being Scale, Quality of Well-Being Scale).[27]

2. Proportion of psychiatric hospital admission

Primary outcomes will be divided into short-term (six months or less), medium-term (seven to 12 months), and long-term (over 12 months). If multiple time points are given, we will use those points closest to six months (for short-term: primary time point), 12 months (for medium-term), and 24 months (for long-term).

Secondary outcomes

1. Personal recovery, as measured using a validated clinical instrument (e.g. the Recovery Assessment Scale, the Questionnaire about the Process of Recovery)
2. Overall functioning, as measured using a validated clinical instrument (e.g. the Global Assessment of Functioning, the Psychosocial Performance Scale).
3. Overall psychotic symptoms, as measured using a validated clinical instrument (e.g. the Positive and Negative Syndrome Scale, the Brief Psychiatric Rating Scale).
4. Positive symptoms, as measured using a validated clinical instrument (e.g. positive symptom subscale of the Positive and Negative Syndrome Scale, positive symptom subscale of the Brief Psychiatric Rating Scale, the Scales for Assessment of Positive Symptoms).
5. Negative symptoms, as measured using a validated clinical instrument (e.g. the Clinical Assessment Interview for Negative Symptoms, the Brief Negative Symptom Scale, negative symptom subscale of the Positive and Negative Syndrome Scale, negative symptom subscale of the Brief Psychiatric Rating Scale, the Scales for Assessment of Negative Symptoms).
6. Tolerability, defined as the proportion of participants experiencing severe adverse events (e.g. deaths, attempts at suicide, suicide ideation, serious violent incidents).

7. Acceptability, defined as the proportion of premature discontinuation (dropout rate) for any reason.

For secondary outcomes, we will use outcomes collected at the given endpoint of each study. If multiple time points are set, we will use those points that are six months or less and the closest to six months.

**Search strategy**

The following sources will be searched without restrictions for language or publication period: Embase, PubMed, PsycINFO, CINAHL, the Cochrane Central Register of Controlled Trials (CENTRAL), ClinicalTrials.gov, and World Health Organisation International Clinical Trials Registry Platform (ICTRP). Table 1 presents an example of a search strategy for PubMed (see online supplemental appendix for a full search strategy in different databases). The date of the last search update will be provided in the final publication.

We will also try to identify other potentially eligible studies or ancillary publications by searching the reference lists of included studies, other relevant systematic reviews, and grey literature (OpenGrey).

**Table 1**. An example of a search strategy for PubMed.

| Line | Query |
|---|---|
| #1 | "schizophrenia spectrum and other psychotic disorders"[MeSH Terms] OR "schizo*"[Title/Abstract] OR "psychotic*"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "psychoses"[Title/Abstract] |
| #2 | "psychotherapy"[MeSH Terms] OR "psychoanalysis"[MeSH Terms] OR "counseling"[MeSH Terms] OR "community mental health services"[Mesh Terms] OR "psychiatric rehabilitation"[Mesh Terms] OR "acceptance and commitment therap*"[Title/Abstract] OR "assertive communit*"[Title/Abstract] OR "behavior modificat*"[Title/Abstract] OR "behavior regulat*"[Title/Abstract] OR "behavior therap*"[Title/Abstract] OR "behaviour modificat*"[Title/Abstract] OR "behaviour regulat*"[Title/Abstract] OR "behaviour therap*"[Title/Abstract] OR "behavioral modificat*"[Title/Abstract] OR "behavioral regulat*"[Title/Abstract] OR "behavioral therap*"[Title/Abstract] OR |

| | |
|---|---|
| | "behavioural modificat*"[Title/Abstract] OR "behavioural regulat*"[Title/Abstract] OR "behavioural therap*"[Title/Abstract] OR "cognitive behavio*"[Title/Abstract] OR "cognitive intervent*"[Title/Abstract] OR "cognitive rehabilitat*"[Title/Abstract] OR "cognitive remediat*"[Title/Abstract] OR "cognitive technique*"[Title/Abstract] OR "cognitive therap*"[Title/Abstract] OR "cognitive treatment*"[Title/Abstract] OR "compassion focused"[Title/Abstract] OR "conversational therap*"[Title/Abstract] OR "conversion therap*"[Title/Abstract] OR "counseling"[Title/Abstract] OR "counselling"[Title/Abstract] OR "emotion focused"[Title/Abstract] OR "emotionally focused"[Title/Abstract] OR "emotional focused"[Title/Abstract] OR "exposure therap*"[Title/Abstract] OR "family intervent*"[Title/Abstract] OR "family therap*"[Title/Abstract] OR "group intervent*"[Title/Abstract] OR "group therap*"[Title/Abstract] OR "meditation"[Title/Abstract] OR "metacognitive therap*"[Title/Abstract] OR "metacognitive training"[Title/Abstract] OR "meta-cognitive therap*"[Title/Abstract] OR "meta-cognitive training"[Title/Abstract] or "mindfulness"[Title/Abstract] OR "morita therap*"[Title/Abstract] OR "narrative therap*"[Title/Abstract] OR "problem solv*"[Title/Abstract] OR "psychoanaly*"[Title/Abstract] OR "psychodynamic*"[Title/Abstract] OR "psychoeducat*"[Title/Abstract] OR "psychological treatment*"[Title/Abstract] OR "psychological intervent*"[Title/Abstract] OR "psychosocial treatment*"[Title/Abstract] OR "psychosocial intervent*"[Title/Abstract] OR "psychotherap*"[Title/Abstract] OR "socioenvironmental therap*"[Title/Abstract] OR "social skills training*"[Title/Abstract] OR "supportive therap*"[Title/Abstract] OR "psychiatric rehabili*"[Title/Abstract] OR "psychosocial rehabili*"[Title/Abstract] OR "token economy"[Title/Abstract] OR "peer support*"[Title/Abstract] OR "peer deliver*"[Title/Abstract] OR "supported employment"[Title/Abstract] OR "advance directive*"[Title/Abstract] OR "crisis plan*"[Title/Abstract] OR "wellness recovery action planning"[Title/Abstract] OR "illness management"[Title/Abstract] OR "refocus"[Title/Abstract] OR "individual placement and support"[Title/Abstract] OR "supported housing"[Title/Abstract] OR "open dialogue"[Title/Abstract] OR "community treatment order*"[Title/Abstract] |
| #3 | "randomized controlled trials as topic"[MeSH Terms] OR "controlled clinical trial"[Publication Type] OR "random*"[Title/Abstract] OR "RCT"[Title/Abstract] or "control*"[Title/Abstract] OR "trial*"[Title/Abstract] OR "condition*"[Title/Abstract] |

| | |
|---|---|
| #4 | #1 AND #2 AND #3 |
| #5 | #4 NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms]) |

**Screening and data extraction**

Screening

All search results will be catalogued using EndNote. After removing duplicates, screening and selection of studies will be managed using Rayyan. Eligibility of each study will be determined with the aid of a two-step screening procedure. First, screening of titles and abstracts will be conducted. Second, full-text screening of studies selected in the first screening will be performed. Both the first and second screening will be performed by two independent, blinded reviewers. We will include studies that both reviewers judge to be "included". Prior to the formal screening, our review team will work together to screen a small sample of studies to ensure accuracy and consistency among reviewers. If both reviewers disagree even after discussion, we will consult another reviewer to make a decision. If there are any uncertainties about eligibility for this study, we will ask the authors of the original studies to provide further information. Details of selection process will be presented in the PRISMA flow chart.

Data extraction

Two reviewers will independently extract data from each selected study using a pre-designed form in Microsoft Excel. The following data will be extracted from each included study:

- Publication information: authors name, publication year
- Study characteristics: country in which the study was conducted, study design (type of RCT), number of arms, number randomised to each arm, randomisation method
- Participant demographics: mean age, proportion of female/male, proportion of ethnicity, proportion of first-episode cases, details on diagnosis, method of diagnostic assessment
- Intervention/comparator characteristics: type of intervention (e.g. social skills training, cognitive behavioural therapy), setting/context (outpatient clinic, other facilities, home, or combination), format (individual, group, or combination), intensity and type of

contact/support (therapist-led, self-help [no contact/support], or combination; face-to-face, remote [e.g. telephone, e-mail, internet], or combination), inclusion of intervention for partners/family members, expertise of therapist (e.g. doctor, nurse, psychologist), intervention dose (number and frequency of sessions/contacts, time span of the intervention), type of comparator (non-active intervention [e.g. treatment as usual], waiting list, or other non-active interventions [e.g. psychological/pill placebo])

- Outcome measures: primary and secondary outcomes specified and collected, method of collection (self-reported or assessor-rated), and time points reported
- Others: potential conflicts of interest and funding agencies

Before extracting data, a calibration exercise will be undertaken to ensure accuracy and consistency among reviewers. If there is any discrepancy between reviewers even after discussion, we will consult another reviewer in order to reach consensus. If needed, we will ask study authors to obtain additional data and/or further clarification.

**Risk of bias assessment**

The risk of bias for the included studies will be assessed with Revised Cochrane Risk-of-Bias Tool for Randomised Trials (RoB 2). Two reviewers will independently assess the following bias domains:

- Bias arising from the randomisation process
- Bias due to deviations from intended interventions
- Bias due to missing outcome data
- Bias in measurement of the outcome
- Bias in selection of the reported result
- Other biases.

Assessments will be classified into three levels according to the quality classification standards: low risk, some concerns, and high risk of bias. Any disagreements/discrepancies will be resolved through discussion. If necessary, we will contact the study authors for further information. Effects of studies with a high risk of bias in the overall domain will be evaluated by sensitivity analyses.

## Strategy for data synthesis and statistical analysis

### *Characteristics of the included studies*

We will produce descriptive statistics and study population characteristics across all included studies, describing the types of comparisons and other clinical or methodological variables mentioned above.

### *Measurement of intervention effect*

The extracted data will be synthesised into a meta-analysis where possible. We will perform standard pairwise meta-analyses with a random-effects model for every comparison with at least two studies. Statistical analysis will be carried out using the Cochrane Collaboration's Review Manager (RevMan) software (version 5.4 for Windows). Acknowledging heterogeneity in psychosocial interventions for schizophrenia, we will perform random effects meta-analyses with all intervention types together along with subgroup analyses for each intervention type separately. For continuous outcomes (quality of life, personal recovery, overall functioning, overall psychotic symptoms, and positive/negative symptoms), standardised mean differences with 95% confidence intervals (CIs) will be calculated. For dichotomous outcomes (e.g. hospital admission, severe adverse events, and premature discontinuation), risk ratios with 95% CIs will be calculated. The data for each meta-analysis will be presented in a forest plot.

### *Dealing with missing data*

We will assess levels of attrition for included studies, and conduct sensitivity analysis of the impact of including studies with missing data of 20% or more. For all outcomes, we will conduct intention-to-treat analysis wherever possible.

### *Assessment of heterogeneity*

Heterogeneity will be evaluated by using the inconsistency index ($I^2$) statistic to describe the percentages of total variation across studies ($I^2 \leq 50\%$ = low; $I^2 > 50\%$ = moderate to high). Where appropriate for pooling effect sizes, a fixed-effects model will be used when heterogeneity is low, and

a random-effects model will be used when heterogeneity is moderate to high. If any substantial heterogeneity is observed, we will perform further subgroup analysis.

***Assessment of publication bias***

If a sufficient number of studies (10 or more) are eligible for meta-analysis, funnel plots will be used to assess reporting bias.

***Analysis of subgroups or subsets***

If any substantial heterogeneity is identified, the following potential effect moderators of primary outcomes will be explored by subgroup analyses:

- Type of intervention
- Intervention setting/context (facility-based [e.g. outpatient clinic] versus others [e.g. home])
- Intervention format (individual versus group)
- Intensity of contact/support (therapist-led versus self-help [no contact/support])
- Mean age of participants (aged ≤35 versus >35 years)
- Country categories (high-income versus low to middle-income countries [based on World Bank income group])

If possible, we will perform some extra subgroup analyses according to the results of heterogeneity and inconsistency. Subgroup differences will be assessed by interaction tests. The results of subgroup analyses will be reported quoting the $I^2$ statistic and p value, and the interaction test $I^2$ value.

We also plan to perform sensitivity analysis on primary outcomes to observe the effects of excluding studies with high risk of bias in the overall domain, studies focused on first episode cases, and studies focused on treatment-resistant cases.

***Assessment of the confidence in cumulative evidence***

The Grades of Recommendation Assessment, Development and Evaluation (GRADE) approach will be used to rate the overall evidence. Data will be imported from RevMan to the GRADE profiler (GRADEpro) software to produce "summary of findings" tables. These tables will provide key information regarding evidence quality, intervention effect, and a summary of available data on the outcome variables. The quality of the body of evidence will be assessed based on five factors: study limitations, consistency of effect, imprecision, indirectness, and publication bias. Assessments will be judged/categorised as "high", "moderate", "low", and "very low".

## ETHICS AND DISSEMINATION

This study will consist of secondary analyses of existing anonymous data (i.e. primary data will not be collected); hence, no formal ethical review/assessment is required. We plan to disseminate the study findings through conference presentations as well as publications in peer-reviewed journals.

## DISCUSSION

There are two key methodological strengths. First, this study will only include relevant randomised controlled trials in order to avoid sources of bias that are commonly seen in quasi-experimental clinical trials, particularly when employing pre–post study design without control groups. Second, this study will accept all relevant trials from both high-income and low to middle-income countries, without placing restrictions on language of publication. The main strengths listed above will make the study findings applicable to a wide range of countries, have the potential to inform and influence clinical decision-making, and serve as a guide for planning meaningful mental healthcare resource allocation.

The following methodological limitations must also be taken into consideration. First, we will only include randomised controlled trials in our study. Since many low to middle-income countries still lack sufficient capacity to conduct randomised controlled trials (mainly due to limited available funds, facilities, healthcare professionals), evidence from non-randomised controlled trials are also important. However, since our study will focus on a wide range of psychosocial interventions and accept all relevant trials from both high-income and low to middle-income countries, there is a

risk of obtaining too many records and including too many studies in the analysis if we accept non-randomised trials; this would have a serious negative impact on the feasibility of our study. In addition, several existing systematic reviews, focusing on psychosocial interventions for schizophrenia in low- and middle-income countries, have also only accepted randomised controlled trials in their analyses.[28, 36] Thus, we decided to limit the scope of our study to randomised controlled trials. Second, our secondary outcome regarding negative symptoms will be based on data from validated clinical instruments, but some of the commonly-used instruments (e.g. negative symptom subscale of the Positive and Negative Syndrome Scale, the Scale for the Assessment of Negative Symptoms) include some aspects not relevant to the current conceptualisation of negative symptoms.[2]

Findings of this study may be limited by publication bias, study heterogeneity, the measurements used to assess quality of life (primary outcome), and the methodological quality of included studies. These limitations will be addressed with the Revised Cochrane Risk-of-Bias Tool for Randomised Trials (RoB 2), and the credibility of the results will be assessed using the Grades of Recommendation Assessment, Development and Evaluation (GRADE) approach.

To the best of our knowledge, this proposed systematic review and meta-analysis will be the first to focus on the efficacy of all types of psychosocial interventions for community-dwelling individuals with schizophrenia and related disorders. Through this review, an overall picture of available evidence on the efficacy of psychosocial interventions in this population will be available. Additional analyses will also identify effective psychosocial interventions for specific populations, intervention types (including delivery methods), and so on, associated with intervention effectiveness. Such findings will serve to augment existing evidence that can inform service users, mental health professionals, and policy makers about choices in treatment/care, the development of new interventions, and the meaningful allocation of mental healthcare resources for managing community-dwelling individuals with schizophrenia.

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**Authors' contributions**: YS, HT, HI, and NY designed the study protocol, and drafted the manuscript. HN, FY, TG, YK, AT, HS, and YI contributed with clinical and methodological input in planning the protocol. All authors critically revised the draft and contributed to and have approved the final manuscript.

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**Competing interests statement**: HI has received consulting fees from Mitsubishi-Tanabe Pharma; honoraria for lectures from Mochida Pharmaceutical, Otsuka Pharmaceutical, and Kyowa Pharmaceutical. TG has received honorarium for writing from Igaku-Shoin. AT has received honoraria for lectures from Mitsubishi-Tanabe Pharma, Sumitomo Dainippon Pharma, and Otsuka Pharmaceutical. HS has received honoraria for lectures/presentations from Pfizer, Sanofi, Alexion Pharmaceuticals, Novo Nordisk Pharma, Sumitomo Dainippon Pharma, JCR Pharmaceuticals, Miyazaki City and Country Medical Association, Children's Cancer Association of Japan, and Miyazaki Health Promotion Association; payment for expert testimony from Kyushu Conference for School Physical Examination, Miyazaki City and Country Medical Association, and Miyazaki Prefectural Health Foundation; he is a leader of Committee for Growth Charts at School of Miyazaki City and Country Medical Association, and Specialist Committee on Newborn Screening Tests of Miyazaki Prefectural Health Foundation. YI has received contracts from Tsumura; honoraria for lectures from Otsuka Pharmaceutical, Sumitomo Dainippon Pharma, Meiji Seika Pharma, Tsumura, Yoshitomiyakuhin Corporation, Takeda Pharmaceutical, Eisai, Mochida Pharmaceutical, Kyowa Kirin, MSD, and Towa Pharmaceutical. NY has received a book royalty from Medical Friend; honoraria for lectures from Gakken Medical Support, Eisai, Meiji Seika Pharma, Mitsubishi-Tanabe Pharma, and Mochida Pharmaceutical; honoraria for writings from Igaku-Shoin, Nikkei Business Publications, and Maruzen Publishing; he is a Diplomate of the Academy of Cognitive and Behavioral

Therapies, Secretary Board Member of the Japanese Association for Cognitive Therapy, and Member of the Japan Clinical Guideline Development Group for Anxiety Disorders and Obsessive-Compulsive Disorder. All of the other authors declare that they have no competing interests.

**Patient consent for publication**: Not required.

**Patient and public involvement statement**: Neither patients nor the public was involved in the design, conduct, reporting, or dissemination plans of this study.

**Provenance and peer review**: Not commissioned; externally peer reviewed.

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**Supplementary Appendix.** Search strategy in different databases

PubMed

| Line | Query |
|---|---|
| 1 | "schizophrenia spectrum and other psychotic disorders"[MeSH Terms] OR "schizo*"[Title/Abstract] OR "psychotic*"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "psychoses"[Title/Abstract] |
| 2 | "psychotherapy"[MeSH Terms] OR "psychoanalysis"[MeSH Terms] OR "counseling"[MeSH Terms] OR "community mental health services"[Mesh Terms] OR "psychiatric rehabilitation"[Mesh Terms] OR "acceptance and commitment therap*"[Title/Abstract] OR "assertive communit*"[Title/Abstract] OR "behavior modificat*"[Title/Abstract] OR "behavior regulat*"[Title/Abstract] OR "behavior therap*"[Title/Abstract] OR "behaviour modificat*"[Title/Abstract] OR "behaviour regulat*"[Title/Abstract] OR "behaviour therap*"[Title/Abstract] OR "behavioral modificat*"[Title/Abstract] OR "behavioral regulat*"[Title/Abstract] OR "behavioral therap*"[Title/Abstract] OR "behavioural modificat*"[Title/Abstract] OR "behavioural regulat*"[Title/Abstract] OR "behavioural therap*"[Title/Abstract] OR "cognitive behavio*"[Title/Abstract] OR "cognitive intervent*"[Title/Abstract] OR "cognitive rehabilitat*"[Title/Abstract] OR "cognitive remediat*"[Title/Abstract] OR "cognitive technique*"[Title/Abstract] OR "cognitive therap*"[Title/Abstract] OR "cognitive treatment*"[Title/Abstract] OR "compassion focused"[Title/Abstract] OR "conversational therap*"[Title/Abstract] OR "conversion therap*"[Title/Abstract] OR "counseling"[Title/Abstract] OR "counselling"[Title/Abstract] OR "emotion focused"[Title/Abstract] OR "emotionally focused"[Title/Abstract] OR "emotional focused"[Title/Abstract] OR "exposure therap*"[Title/Abstract] OR "family intervent*"[Title/Abstract] OR "family therap*"[Title/Abstract] OR "group intervent*"[Title/Abstract] OR "group therap*"[Title/Abstract] OR "meditation"[Title/Abstract] OR "metacognitive therap*"[Title/Abstract] OR "metacognitive training"[Title/Abstract] OR "meta-cognitive therap*"[Title/Abstract] OR "meta-cognitive training"[Title/Abstract] or "mindfulness"[Title/Abstract] OR "morita therap*"[Title/Abstract] OR "narrative therap*"[Title/Abstract] OR "problem solv*"[Title/Abstract] OR "psychoanaly*"[Title/Abstract] OR "psychodynamic*"[Title/Abstract] OR "psychoeducat*"[Title/Abstract] OR "psychological treatment*"[Title/Abstract] OR "psychological intervent*"[Title/Abstract] OR "psychosocial treatment*"[Title/Abstract] OR "psychosocial intervent*"[Title/Abstract] OR "psychotherap*"[Title/Abstract] OR |

| | |
|---|---|
| | "socioenvironmental therap*"[Title/Abstract] OR "social skills training*"[Title/Abstract] OR "supportive therap*"[Title/Abstract] OR "psychiatric rehabili*"[Title/Abstract] OR "psychosocial rehabili*"[Title/Abstract] OR "token economy"[Title/Abstract] OR "peer support*"[Title/Abstract] OR "peer deliver*"[Title/Abstract] OR "supported employment"[Title/Abstract] OR "advance directive*"[Title/Abstract] OR "crisis plan*"[Title/Abstract] OR "wellness recovery action planning"[Title/Abstract] OR "illness management"[Title/Abstract] OR "refocus"[Title/Abstract] OR "individual placement and support"[Title/Abstract] OR "supported housing"[Title/Abstract] OR "open dialogue"[Title/Abstract] OR "community treatment order*"[Title/Abstract] |
| 3 | "randomized controlled trials as topic"[MeSH Terms] OR "controlled clinical trial"[Publication Type] OR "random*"[Title/Abstract] OR "RCT"[Title/Abstract] or "control*"[Title/Abstract] OR "trial*"[Title/Abstract] OR "condition*"[Title/Abstract] |
| 4 | #1 AND #2 AND #3 |
| 5 | #4 NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms]) |

Embase (via Elsevier)

| Line | Query |
|---|---|
| #1 | 'psychosis'/exp OR (schizo* OR psychotic* OR psychosis OR psychoses):ti,ab |
| #2 | 'psychotherapy'/exp OR 'psychoanalysis'/exp OR 'counseling'/exp OR 'community mental health service'/exp or 'psychosocial rehabilitation'/exp OR (acceptance near/2 commitment* OR assertive* near/1 communit* OR (behavior* or behaviour*) near/1 (modificat* or regulat* or therap*) OR cognit* near/2 (behavio* or intervent* or rehabilitat* or remediat* or technique* or therap* or treatment*) OR compassion* near/1 focused* OR (conversation* or conversion* or supportive or socioenvironment*) near/1 therap* OR counse?ing OR emotion* near/1 focused* OR exposure near/1 therap* OR (family or group) near/1 (intervent* or therap*) OR meditation* OR (metacognitive or meta-cognitive) near/1 (therap* or training*) OR mindfulness OR morita near/1 therap* OR narrative near/1 therap* OR problem near/1 solv* OR psychoanaly* OR psychodynamic* OR psychoeducat* OR psychological near/1 (treatment* or intervent*) OR psychosocial near/1 (treatment* or intervent*) OR psychotherap* OR social near/1 skill* near/1 training* OR (psychosocial* or psychiatric*) near/1 rehabilitat*<br><br>OR token near/1 economy OR peer near/1 support* OR peer near/1 deliver* OR supported near/1 employment OR advance near/1 directive* OR crisis near/1 plan* |

| | |
|---|---|
| | OR 'wellness recovery action planning' OR 'illness management and recovery program' OR refocus OR 'individual placement and support' OR supported near/1 housing OR 'open dialogue' OR 'community treatment' near/1 order*):ti,ab |
| #3 | 'controlled clinical trial'/exp OR (random* or control* or trial* or condition* or rct):ti,ab |
| #4 | #1 AND #2 AND #3 |
| #5 | #4 NOT ('animal experiment'/de NOT ('human experiment'/de OR 'human'/de)) |

PsycINFO (via EBSCO host)

| Line | Query |
|---|---|
| S1 | DE "Schizophrenia" OR DE "Acute Schizophrenia" OR DE "Catatonic Schizophrenia" OR DE "Paranoid Schizophrenia" OR DE "Process Schizophrenia" OR DE "Schizoaffective Disorder" OR DE "Schizophrenia (Disorganized Type)" OR DE "Schizophreniform Disorder" OR DE "Undifferentiated Schizophrenia" DE "Delusions" OR TI (schizo* OR psychotic* OR psychosis OR psychoses) OR AB (schizo* OR psychotic* OR psychosis OR psychoses) |
| S2 | DE "Psychotherapy" OR DE "Analytical Psychotherapy" OR DE "Client Centered Therapy" OR DE "Conversion Therapy" OR "Emotion Focused Therapy" OR DE "Group Psychotherapy" OR DE "Individual Psychotherapy" OR DE "Narrative Therapy" OR DE "Psychoanalysis" OR DE "Psychodynamic Psychotherapy" OR DE "Psychotherapeutic Counseling" OR DE "Psychotherapeutic Techniques" OR DE "Supportive Psychotherapy" OR DE "Psychosocial Rehabilitation" OR DE "Psychosocial Readjustment" OR DE "Therapeutic Social Clubs" OR DE "Vocational Rehabilitation" OR DE "Community Mental Health Services" OR DE "Community Services" OR DE "Community Welfare Services" OR DE "Emergency Services" OR DE "Home Care" OR DE "Home Visiting Programs" OR DE "Public Health Services" OR DE "Mental Health Services" OR MM "Assertive Community Treatment" OR TI ("acceptance and commitment therap*" OR "analytical psychotherap*" OR "assertive communit*" OR "behavior modificat*" OR "behaviour regulat*" OR "behavior therap*" OR "behaviour modificat*" OR "behaviour regulat*" OR "behaviour therap*" OR "behavioral modificat*" OR "behavioral regulat*" OR "behavioral therap*" OR "behavioural modificat*" OR "behavioural regulat*" OR "behavioural therap*" OR "cognitive behavio*" OR "cognitive intervent*" OR "cognitive rehabilit*" OR "cognitive remediat*" OR "cognitive technique*" OR "cognitive therap*" OR "cognitive treatment*" OR "compassion focused" OR "conversational therap*" OR "conversion therap*" OR "counseling" OR "counselling" OR "emotion |

| | |
|---|---|
| | focused" OR "emotionally focused" OR "emotional focused" OR "exposure therap*" OR "expressive psychotherap*" OR "family intervent*" OR "family therap*" OR "group intervention*" OR "group psychotherap*" OR "group therap*" OR "meditation" OR "metacognitive therap*" OR "metacognitive training" OR "meta-cognitive therap*" OR "meta-cognitive training" OR "mindfulness" OR "morita therap*" OR "narrative therap*" OR "problem solv*" OR "psychiatric rehabili*" OR "psychoanaly*" OR "psychodynamic" OR "psychoeducat*" OR "psychogical treatment*" OR "psychological intervent*" OR "psychosocial treatment*" OR "psychosocial intervent*" OR "psychosocial rehabili*" OR "psychotherap*" OR "socioenvironmental therap*" OR "social skills training" OR "supportive therap*" OR "token economy" OR "peer support*" OR "peer deliver*" OR "supported employment" OR "advance directive*" OR "crisis plan*" OR "wellness recovery action planning" OR "illness management and recovery program" OR "refocus" OR "individual placement and support" OR "supported housing" OR "open dialogue" OR "community treatment order*") OR AB ("acceptance and commitment therap*" OR "analytical psychotherap*" OR "assertive communit*" OR "behavior modificat*" OR "behaviour regulat*" OR "behavior therap*" OR "behaviour modificat*" OR "behaviour regulat*" OR "behaviour therap*" OR "behavioral modificat*" OR "behavioral regulat*" OR "behavioral therap*" OR "behavioural modificat*" OR "behavioural regulat*" OR "behavioural therap*" OR "cognitive behavio*" OR "cognitive intervent*" OR "cognitive rehabilit*" OR "cognitive remediat*" OR "cognitive technique*" OR "cognitive therap*" OR "cognitive treatment*" OR "compassion focused" OR "conversational therap*" OR "conversion therap*" OR "counseling" OR "counselling" OR "emotion focused" OR "emotionally focused" OR "emotional focused" OR "exposure therap*" OR "expressive psychotherap*" OR "family intervent*" OR "family therap*" OR "group intervention*" OR "group psychotherap*" OR "group therap*" OR "meditation" OR "metacognitive therap*" OR "metacognitive training" OR "meta-cognitive therap*" OR "meta-cognitive training" OR "mindfulness" OR "morita therap*" OR "narrative therap*" OR "problem solv*" OR "psychiatric rehabili*" OR "psychoanaly*" OR "psychodynamic" OR "psychoeducat*" OR "psychological treatment*" OR "psychological intervent*" OR "psychosocial treatment*" OR "psychosocial intervent*" OR "psychosocial rehabili*" OR "psychotherap*" OR "socioenvironmental therap*" OR "social skills training" OR "supportive therap*" OR "token economy" OR "peer support*" OR "peer deliver*" OR "supported employment" OR "advance directive*" OR "crisis plan*" OR "wellness recovery action planning" OR "illness management and recovery program" |

| | |
|---|---|
| | OR "refocus" OR "individual placement and support" OR "supported housing" OR "open dialogue" OR "community treatment order*") |
| S3 | DE "Clinical Trials" OR DE "Randomized Controlled Trials" OR DE "Randomized Clinical Trials" OR TI (random* OR RCT or control* OR trial* OR condition*) OR AB (random* OR RCT or control* OR trial* OR condition*) |
| S4 | S1 AND S2 AND S3 |
| S5 | S4 NOT (DE "Animals" OR DE "Animal Research" OR TI "animal model*" OR AB "animal model*") |

CINAHL (via EBSCO host)

| Line | Search query |
|---|---|
| S1 | MH "Schizophrenia+" OR MH "Schizoaffective Disorder" OR MH "Delusions" OR TI (schizo* OR psychotic* OR psychosis OR psychoses) OR AB (schizo* OR psychotic* OR psychosis OR psychoses) |
| S2 | MH "Psychotherapy+" OR MH "Psychoanalysis" OR MH "Psychological Processes and Principles+" OR MH "Rehabilitation, Psychosocial+" OR MM "Community Mental Health Services" OR TI ("acceptance and commitment therap*" OR "analytical psychotherap*" OR "assertive communit*" OR "behavior modificat*" OR "behaviour regulat*" OR "behavior therap*" OR "behaviour modificat*" OR "behaviour regulat*" OR "behaviour therap*" OR "behavioral modificat*" OR "behavioral regulat*" OR "behavioral therap*" OR "behavioural modificat*" OR "behavioural regulat*" OR "behavioural therap*" OR "cognitive behavio*" OR "cognitive intervent*" OR "cognitive rehabilit*" OR "cognitive remediat*" OR "cognitive technique*" OR "cognitive therap*" OR "cognitive treatment*" OR "compassion focused" OR "conversational therap*" OR "conversion therap*" OR "counseling" OR "counselling" OR "emotion focused" OR "emotionally focused" OR "emotional focused" OR "exposure therap*" OR "expressive psychotherap*" OR "family intervent*" OR "family therap*" OR "group intervention*" OR "group psychotherap*" OR "group therap*" OR "meditation" OR "metacognitive therap*" OR "metacognitive training" OR "meta-cognitive therap*" OR "meta-cognitive training" OR "mindfulness" OR "morita therap*" OR "narrative therap*" OR "problem solv*" OR "psychiatric rehabili*" OR "psychoanaly*" OR "psychodynamic" OR "psychoeducat*" OR "psychogical treatment*" OR "psychological intervent*" OR "psychosocial treatment*" OR "psychosocial intervent*" OR "psychosocial rehabili*" OR "psychotherap*" OR "socioenvironmental therap*" OR "social skills training" OR "supportive therap*" OR "token economy" OR "peer support*" OR "peer deliver*" |

| | |
|---|---|
| | OR "supported employment" OR "advance directive*" OR "crisis plan*" OR "wellness recovery action planning" OR "illness management and recovery program" OR "refocus" OR "individual placement and support" OR "supported housing" OR "open dialogue" OR "community treatment order*") OR AB ("acceptance and commitment therap*" OR "analytical psychotherap*" OR "assertive communit*" OR "behavior modificat*" OR "behaviour regulat*" OR "behavior therap*" OR "behaviour modificat*" OR "behaviour regulat*" OR "behaviour therap*" OR "behavioral modificat*" OR "behavioral regulat*" OR "behavioral therap*" OR "behavioural modificat*" OR "behavioural regulat*" OR "behavioural therap*" OR "cognitive behavio*" OR "cognitive intervent*" OR "cognitive rehabilit*" OR "cognitive remediat*" OR "cognitive technique*" OR "cognitive therap*" OR "cognitive treatment*" OR "compassion focused" OR "conversational therap*" OR "conversion therap*" OR "counseling" OR "counselling" OR "emotion focused" OR "emotionally focused" OR "emotional focused" OR "exposure therap*" OR "expressive psychotherap*" OR "family intervent*" OR "family therap*" OR "group intervention*" OR "group psychotherap*" OR "group therap*" OR "meditation" OR "metacognitive therap*" OR "metacognitive training" OR "meta-cognitive therap*" OR "meta-cognitive training" OR "mindfulness" OR "morita therap*" OR "narrative therap*" OR "problem solv*" OR "psychiatric rehabili*" OR "psychoanaly*" OR "psychodynamic" OR "psychoeducat*" OR "psychological treatment*" OR "psychological intervent*" OR "psychosocial treatment*" OR "psychosocial intervent*" OR "psychosocial rehabili*" OR "psychotherap*" OR "socioenvironmental therap*" OR "social skills training" OR "supportive therap*" OR "token economy" OR "peer support*" OR "peer deliver*" OR "supported employment" OR "advance directive*" OR "crisis plan*" OR "wellness recovery action planning" OR "illness management and recovery program" OR "refocus" OR "individual placement and support" OR "supported housing" OR "open dialogue" OR "community treatment order*") |
| S3 | MH "Clinical Trials+" OR MH "Random Assignment" OR PT Clinical Trial OR TI (random* OR RCT or control* OR trial* OR condition*) OR AB (random* OR RCT or control* OR trial* OR condition*) |
| S4 | S1 AND S2 AND S3 |
| S5 | S4 NOT ((MH "Animals+" OR MM "Animal Studies" OR TI "animal model*" OR AB "animal model*") NOT MM "Human") |

Cochrane Central Register of Controlled Trials (CENTRAL)

| Line | Query |
|---|---|
| #1 | [mh "Schizophrenia Spectrum and Other Psychotic Disorders"] or (schizo* or psychotic* or psychosis or psychoses):ti,ab,kw |
| #2 | [mh Psychotherapy] or [mh Psychoanalysis] or [mh Counseling] or [mh "community mental health services"] or [mh "psychiatric rehabilitation"] or ("acceptance and commitment" or (analytical next psychotherap*) or "assertive community" or ((behavior* or behaviour*) next (modificat* or regulat* or therap*)) or (cognit* next (behavio* or intervent* or rehabili* or remediat* or technique* or therap* or treatment*)) or (compassion* next focused) or ((conversation* or conversion*) next therap*) or counse*ing or (emotion* next focused) or (exposure next therap*) or ((family or group) next (intervent* or therap*)) or meditation* or ((metacognitiv* or meta-cognitiv*) next (therap* or training*)) or mindfulness or (morita next therap*) or (narrative next therap*) or (problem next solv*) or psychoanaly* or psychodynamic* or psychoeducat* or psychological next (treatment* or intervent*) or psychosocial next (treatment* or intervent*) or psychotherap* or (social* next skill* next training*) or ((supportive* or socioenvironment*) next therap*) or ((psychiatric* or psychosocial*) next rehabili*) or "community mental health service" or "token economy" or (peer next support*) or (peer next deliver*) or "supported employment" or (advance next directive*) or (crisis next plan*) or "wellness recovery action planning" or "illness management and recovery program" or "refocus" or "individual placement and support" or "supported housing" or "open dialogue" or (community next treatment next order*)):ti,ab,kw |
| #3 | [mh "Controlled Clinical Trial"] or [mh "Randomized Controlled Trials as Topic"] or (control* or trial* or condition* or random* or rct):ti,ab,kw,pt |
| #4 | #1 and #2 and #3 in Trials |

ClinicalTrials.gov

| Search field | Query |
|---|---|
| Condition or disease | schizo* OR psychotic* OR psychosis OR psychoses |
| Other terms | random OR rct |
| Study type | Interventional studies(clinical trials) |
| Study Results | All Studies |
| Age Group | Adult (18-64) OR Older Adult (65+) |
| Intervention/treatment | assertive community OR cognitive behavio* OR counseling OR family therap* OR psychoeducat* OR psychosocial intervention* OR psychotherap* OR social skills training OR supportive therap* |

World Health Organisation International Clinical Trials Registry Platform (ICTRP)

| Search field | Query |
|---|---|
| Condition | schizo* OR psychotic* OR psychosis OR psychoses |
| Intervention | assertive community OR cognitive behavio* OR counseling OR family therap* OR psychoeducat* OR psychosocial intervention* OR psychotherap* OR social skills training OR supportive therap* |
| Recruitment status | ALL |

OpenGrey

| |
|---|
| (schizo* OR psychotic* OR psychosis OR psychoses) AND ("assertive community" OR counseling OR "family therap*" OR "behavioral therap*" OR psychoeducat* OR psychotherap* OR "supportive therap*") AND (random* OR rct) |

**PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol***

| Section and topic | Item No | Checklist item | Information reported |
|---|---|---|---|
| **ADMINISTRATIVE INFORMATION** | | | |
| Title: | | | |
| Identification | 1a | Identify the report as a protocol of a systematic review | Yes |
| Update | 1b | If the protocol is for an update of a previous systematic review, identify as such | N/A |
| Registration | 2 | If registered, provide the name of the registry (such as PROSPERO) and registration number | Yes |
| Authors: | | | |
| Contact | 3a | Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author | Yes |
| Contributions | 3b | Describe contributions of protocol authors and identify the guarantor of the review | Yes |
| Amendments | 4 | If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments | Yes |
| Support: | | | |
| Sources | 5a | Indicate sources of financial or other support for the review | Yes |
| Sponsor | 5b | Provide name for the review funder and/or sponsor | Yes |
| Role of sponsor or funder | 5c | Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol | Yes |
| **INTRODUCTION** | | | |
| Rationale | 6 | Describe the rationale for the review in the context of what is already known | Yes |
| Objectives | 7 | Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) | Yes |
| **METHODS** | | | |
| Eligibility criteria | 8 | Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review | Yes |
| Information sources | 9 | Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage | Yes |
| Search strategy | 10 | Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be | Yes |

| | | | |
|---|---|---|---|
| | | repeated | |
| Study records: | | | Yes |
| Data management | 11a | Describe the mechanism(s) that will be used to manage records and data throughout the review | Yes |
| Selection process | 11b | State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis) | Yes |
| Data collection process | 11c | Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators | Yes |
| Data items | 12 | List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications | Yes |
| Outcomes and prioritization | 13 | List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale | Yes |
| Risk of bias in individual studies | 14 | Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis | Yes |
| Data synthesis | 15a | Describe criteria under which study data will be quantitatively synthesised | Yes |
| | 15b | If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as $I^2$, Kendall's $\tau$) | Yes |
| | 15c | Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression) | Yes |
| | 15d | If quantitative synthesis is not appropriate, describe the type of summary planned | |
| Meta-bias(es) | 16 | Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies) | Yes |
| Confidence in cumulative evidence | 17 | Describe how the strength of the body of evidence will be assessed (such as GRADE) | Yes |

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

*From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.*

BMJ Open

# Psychosocial interventions for community-dwelling individuals with schizophrenia: study protocol for a systematic review and meta-analysis

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|---|---|
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| Primary Subject Heading: | Mental health |
| Secondary Subject Heading: | Evidence based practice |
| Keywords: | CLINICAL PHYSIOLOGY, Adult psychiatry < PSYCHIATRY, Schizophrenia & psychotic disorders < PSYCHIATRY |
| | |

## TITLE

Psychosocial interventions for community-dwelling individuals with schizophrenia: study protocol for a systematic review and meta-analysis


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**Word count**: 3,812

## ABSTRACT

**Introduction:** Despite the recent global mental health movement of the transition from hospital-centred to integrated community-based services, comprehensive evidence of psychosocial interventions focusing on community-dwelling individuals with schizophrenia is still lacking. To overcome this gap in the current knowledge, we will conduct a systematic review and meta-analysis to assess the efficacy of all types of psychosocial interventions for community-dwelling (non-hospitalised) individuals with schizophrenia when compared to non-active control conditions (e.g. treatment as usual).

**Methods and analysis:** This study protocol has been developed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols guidelines. By March 2022, the following sources will have been searched, without restrictions for language or publication period: Embase, PubMed, PsycINFO, CINAHL, the Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform. We will also try to identify other potentially eligible studies by searching the reference lists of included studies, other relevant systematic reviews, and grey literature. All relevant randomised controlled trials from both high-income and low to middle-income countries will be allowed. Two independent reviewers will conduct the selection/screening of studies, data extraction, and methodological quality assessment of included studies. The primary outcomes are quality of life and psychiatric hospital admission. Standard pairwise meta-analyses with a random-effects model will be conducted. Subgroup and sensitivity analyses will be performed to assess the robustness of the findings. Risk of bias will be assessed with the Revised Cochrane Risk-of-Bias Tool for Randomised Trials. The Grades of Recommendation Assessment, Development and Evaluation approach will be used to assess the quality of evidence.

**Ethics and dissemination:** Ethics approval is not required for this study. The study findings will be disseminated through conference presentations as well as peer-reviewed publications.

**PROSPERO registration number:** CRD42021266187

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- This study will only include relevant randomised controlled trials in order to avoid sources of bias that are commonly seen in quasi-experimental clinical trials.
- This study will accept all relevant trials from both high-income and low to middle-income countries, without placing restrictions on language of publication.
- Findings of this study may be limited by publication bias, study heterogeneity, the measurements used to assess quality of life (primary outcome), and the methodological quality of included studies.

## INTRODUCTION

Schizophrenia is one of the most painful and costliest mental disorders, not only for individuals and their families but also for wider society. Schizophrenia and related disorders are usually diagnosed based on the presence of positive and/or negative symptoms, and functional impairment.[1] Positive symptoms include psychotic manifestations, such as hallucinations, delusions, disorganized thought and speech, and disorganized/catatonic behaviour. Negative symptoms include blunted affect, alogia, anhedonia, asociality, and avolition.[2] The accumulating evidence suggests that negative symptoms have more impact on everyday functioning and quality of life than positive and other symptom factors.[3, 4] Globally, schizophrenia is generally regarded as a low prevalence mental disorder (the global age-standardised point prevalence is 0.28%), but it creates a considerable economic deficit to society due to losses in productivity by individuals, costs for treatment, and significant burdens on health and welfare systems.[5, 6]

Although antipsychotic medication is a global-standard effective treatment option for treating/managing psychotic symptoms (especially for positive symptoms),[7] 20–30% of people with schizophrenia are resistant to antipsychotics,[8] and 27% of individuals who had been treated with antipsychotics experienced a psychotic relapse within one year.[9] Furthermore, antipsychotics are of less benefit for negative symptoms.[10] However, limited evidence has suggested that psychosocial interventions are effective for managing treatment-resistant schizophrenia,[11] and for ameliorating negative symptoms.[12] In this context, to assist in promoting recovery, there is consensus that treatment for schizophrenia should offer a full range of pharmacological and psychosocial interventions (including social and occupational interventions).[13] Furthermore, in many countries (especially economically developed countries), mental health services have been transformed from hospital-centred to integrated community-based services by reducing the size of hospitals (e.g. the number of hospital beds) and developing community-based services. Thus, effective psychosocial interventions for community-dwelling individuals with schizophrenia are in high demand around the world.

Based on systematic reviews and meta-analyses of randomised controlled trials, there is now an increasing body of evidence concerning the efficacy of a range of psychosocial interventions for

schizophrenia (mostly on positive symptoms and relapse prevention), such as psychoeducation,[14] social skills training,[15] cognitive behavioural therapy,[16-18] family intervention,[19] and assertive community treatment.[20] A recent network meta-analysis has evaluated the efficacy of psychological interventions for positive symptoms in schizophrenia, and has found higher efficacy for cognitive behavioural therapy in comparison with an inactive control condition for positive symptoms and treatment response.[21] McDonagh and colleagues have also conducted an updated systematic review, based on existing systematic reviews and additional trials, and reported that most psychosocial interventions for adults with schizophrenia were more effective in improving several outcomes (e.g. functional outcomes, quality of life, and core illness symptoms) when compared to treatment as usual.[22] However, most of the systematic reviews and meta-analyses did not consider the type of intervention setting/context (i.e. efficacy of psychosocial interventions conducted in the inpatient and outpatient settings were combined/complex). Some of the studies have performed subgroup or sensitivity analyses according to intervention setting, but most compared or stratified intervention settings in these studies were hospital-based (i.e. inpatient vs outpatient settings).[23-27] One meta-analysis[28] investigated the efficacy of community-based psychosocial interventions for schizophrenia, but this study only focused on low and middle-income countries where there are severe shortages of mental healthcare resources (i.e. limited available facilities and healthcare professionals).[29]

To summarise, despite the recent global mental health movement of the transition from hospital-centred to integrated community-based services, comprehensive evidence of psychosocial interventions focusing on community-dwelling individuals with schizophrenia is still lacking. To overcome this gap in the current knowledge, we will perform a systematic review and meta-analysis to assess the efficacy of all types of psychosocial interventions for community-dwelling individuals with schizophrenia when compared to non-active control conditions (e.g. treatment as usual, waiting list). We are specifically interested in community-based psychosocial interventions, but it is difficult to define “community-based” or “community-setting” because healthcare/welfare systems and available facilities/services are widely varied across countries. Thus, we decided to focus only on psychosocial interventions that target community-dwelling individuals with schizophrenia (e.g.

outpatient, day-care, outreach settings), and that cover all intervention settings/contexts except inpatient settings. We will allow studies from both high-income and low to middle-income countries. A better understanding of the meta-analytic efficacy of these psychosocial interventions would be important for clinical practice and for planning meaningful mental healthcare resource allocation.

This review focuses on quality of life and hospital admission as primary outcome measures. We set our key outcome measures based on the standard set of outcomes for psychotic disorders, defined by an international group of leading psychiatrists, psychologists, mental health experts, measurement experts, and lived experience experts (International Consortium for Health Outcomes Measurement: ICHOM).[30] The belief that "recovery" is a key concept in mental health policy across different settings is now gaining wide acceptance around the world. In the ICHOM's standard outcome set,[30] the domain of "recovery" consists of two key outcomes: quality of life and personal recovery. Among these two outcomes, we focus on quality of life as a primary outcome because: (1) quantitative research assessing personal recovery is rapidly increasing,[31-33] but a limited number of studies are available that used personal recovery as an outcome to evaluate community-based psychosocial interventions (quality of life is the most frequently used outcome);[34] and (2) quality of life is the most strongly associated enabling factor for personal recovery in the community setting.[35] We also focus on hospital admission as the other primary outcome because: (1) this outcome is also included in the ICHOM's outcome set;[30] (2) preventing or reducing hospital admission is one of the key aims (targeted outcomes) in most community-based psychosocial interventions for schizophrenia;[22] and (3) hospital admission is one of the commonly-used outcomes for evaluating community-based interventions/services in previous studies.[34]

## METHODS AND ANALYSIS

This systematic review and meta-analysis has been developed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines,[36] and the study protocol has been registered with the International Prospective Register of Systematic Reviews (PROSPERO) (registration number: CRD42021266187). The PROSPERO record will be updated with any amendments/revisions made.

**Types of studies**

All relevant randomised controlled trials (RCTs), including cluster RCTs, will be included. We will accept open and blinded RCTs. This choice is particularly relevant in trials on psychosocial interventions, in which only the outcome assessor can be blind, but not the providers or participants (i.e. Prospective Randomised Open, Blinded End-point [PROBE] trials). In the case of cross-over studies, we will use only the first cross-over phase. Where people are given additional treatments as well as psychosocial intervention plus standard care, we will only include data if the adjunct treatment is evenly distributed between groups and it is only the psychosocial intervention that is randomised. We will include studies from both high-income and low to middle-income countries.

**Types of participants**

Community-dwelling individuals aged 18 years or older with a primary diagnosis of schizophrenia or related disorders, including schizophreniform disorder, schizoaffective disorder, and delusional disorder, will be considered. Any version of the International Classification of Diseases (ICD), Diagnostic and Statistical Manual of Mental Disorders (DSM), Research Diagnostic Criteria (RDC), Feighner criteria, as well as clinical judgment are accepted.

We will not include participants deemed to be "at-risk" of developing schizophrenia, and who have a developmental impairment, intellectual disability, or organic psychosis. Studies including participants diagnosed with other mental disorders will be included only if (a) data on participants with a diagnosis of schizophrenia or related disorders can be extracted separately, or (b) participants with a diagnosis of schizophrenia or related disorders constitute more than 80% of the participants in each arm.

**Types of interventions and comparators**

We will include any psychosocial intervention as long as it targets community-dwelling (i.e. non-hospitalised) individuals with schizophrenia and related disorders. Psychosocial interventions are defined as any structured intervention focusing on individuals' psychological and/or social factors as

opposed to biological factors (e.g. pharmacological intervention). We will consider the nodes for the psychosocial interventions displayed in Supplementary Appendix 1. However, we expect a huge number of studies and categories of interventions to be included. If we find interventions of interest that do not fit in the prespecified nodes, we will define an additional category 'Other' or add new categories if there are a sufficient number of studies.

Interventions could be implemented through a range of modes (e.g. face-to-face, telephone, internet-delivered). Psychosocial interventions may also target just individuals with schizophrenia, or schizophrenic individuals and their partners/family members. Unguided self-help interventions at home (e.g. self-help books, online self-help programmes) will also be allowed. Interventions that take place in inpatient settings will be excluded. Interventions that take place in both inpatient and other settings will be included only if the interventions that take place outside of inpatient settings constitute more than 80% of the total sessions or the intervention period. We will accept any co-intervention to psychosocial intervention only if there is a comparison group that received the co-intervention alone, regardless of whether the co-intervention is active or non-active. No limit is set for the study duration or number of sessions provided in an intervention.

Comparators (i.e. control conditions) will include treatment as usual, waiting list, as well as non-active interventions (e.g. psychological placebo). As for psychological placebo, it is regarded as those interventions intended to control for non-specific aspects of the intervention by the researchers (e.g. befriending, recreation and support, social activity therapy, supportive counselling). When treatment as usual is used as a waiting list, we will classify this condition as a waiting list. Co-intervention alone will be classified as treatment as usual. Examples of appropriate designs are as follows:

- Psychosocial intervention versus control (treatment as usual; waiting list; non-active interventions)
- Psychosocial intervention plus medication versus medication
- Psychosocial intervention A plus psychosocial intervention B versus psychosocial intervention B

**Types of outcome measures**

Primary outcomes

1. Quality of life, as measured using a validated clinical instrument (e.g. the World Health Organisation Quality-of-Life Scale, the Medical Outcomes Study Short-Form, EuroQoL, the Centers for Disease Control and Prevention Health-Related Quality of Life, the Flanagan's Quality of Life Scale, Heinrich's Quality of Life Scale, the McGill Quality of Life Questionnaire). If an identified study does not measure quality of life, we will use a validated clinical instrument measuring "well-being", which has closely related constructs with quality of life (e.g. the World Health Organization Well-Being Index, Warwick-Edinburgh Mental Well-being Scale, Quality of Well-Being Scale).[27]
2. Proportion of psychiatric hospital admission

Primary outcomes will be divided into short-term (six months or less), medium-term (seven to 12 months), and long-term (over 12 months). If multiple time points are given, we will use those points closest to six months (for short-term: primary time point), 12 months (for medium-term), and 24 months (for long-term).

Secondary outcomes

1. Personal recovery, as measured using a validated clinical instrument (e.g. the Recovery Assessment Scale, the Questionnaire about the Process of Recovery).
2. Overall functioning, as measured using a validated clinical instrument (e.g. the Global Assessment of Functioning, the Psychosocial Performance Scale).
3. Overall psychotic symptoms, as measured using a validated clinical instrument (e.g. the Positive and Negative Syndrome Scale, the Brief Psychiatric Rating Scale).
4. Positive symptoms, as measured using a validated clinical instrument (e.g. positive symptom subscale of the Positive and Negative Syndrome Scale, positive symptom subscale of the Brief Psychiatric Rating Scale, the Scales for Assessment of Positive Symptoms).

5. Negative symptoms, as measured using a validated clinical instrument (e.g. the Clinical Assessment Interview for Negative Symptoms, the Brief Negative Symptom Scale, negative symptom subscale of the Positive and Negative Syndrome Scale, negative symptom subscale of the Brief Psychiatric Rating Scale, the Scales for Assessment of Negative Symptoms).
6. Tolerability, defined as the proportion of participants experiencing severe adverse events (e.g. deaths, attempts at suicide, suicide ideation, serious violent incidents).
7. Acceptability, defined as the proportion of premature discontinuation (dropout rate) for any reason.

For secondary outcomes, we will use outcomes collected at the given endpoint of each study. If multiple time points are set, we will use those points that are six months or less and the closest to six months.

**Search strategy**

The following sources will be searched without restrictions for language or publication period: Embase, PubMed, PsycINFO, CINAHL, the Cochrane Central Register of Controlled Trials (CENTRAL), ClinicalTrials.gov, and World Health Organisation International Clinical Trials Registry Platform (ICTRP). Table 1 presents an example of a search strategy for PubMed (see online Supplemental Appendix 2 for a full search strategy in different databases). The date of the last search update will be provided in the final publication.

We will also try to identify other potentially eligible studies or ancillary publications by searching the reference lists of included studies, other relevant systematic reviews, and grey literature (OpenGrey).

**Table 1**. An example of a search strategy for PubMed.

| Line | Query |
|---|---|

| | |
|---|---|
| #1 | "schizophrenia spectrum and other psychotic disorders"[MeSH Terms] OR "schizo*"[Title/Abstract] OR "psychotic*"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "psychoses"[Title/Abstract] |
| #2 | "psychotherapy"[MeSH Terms] OR "psychoanalysis"[MeSH Terms] OR "counseling"[MeSH Terms] OR "community mental health services"[Mesh Terms] OR "psychiatric rehabilitation"[Mesh Terms] OR "acceptance and commitment therap*"[Title/Abstract] OR "assertive communit*"[Title/Abstract] OR "behavior modificat*"[Title/Abstract] OR "behavior regulat*"[Title/Abstract] OR "behavior therap*"[Title/Abstract] OR "behaviour modificat*"[Title/Abstract] OR "behaviour regulat*"[Title/Abstract] OR "behaviour therap*"[Title/Abstract] OR "behavioral modificat*"[Title/Abstract] OR "behavioral regulat*"[Title/Abstract] OR "behavioral therap*"[Title/Abstract] OR "behavioural modificat*"[Title/Abstract] OR "behavioural regulat*"[Title/Abstract] OR "behavioural therap*"[Title/Abstract] OR "cognitive behavio*"[Title/Abstract] OR "cognitive intervent*"[Title/Abstract] OR "cognitive rehabilitat*"[Title/Abstract] OR "cognitive remediat*"[Title/Abstract] OR "cognitive technique*"[Title/Abstract] OR "cognitive therap*"[Title/Abstract] OR "cognitive treatment*"[Title/Abstract] OR "compassion focused"[Title/Abstract] OR "conversational therap*"[Title/Abstract] OR "conversion therap*"[Title/Abstract] OR "counseling"[Title/Abstract] OR "counselling"[Title/Abstract] OR "emotion focused"[Title/Abstract] OR "emotionally focused"[Title/Abstract] OR "emotional focused"[Title/Abstract] OR "exposure therap*"[Title/Abstract] OR "family intervent*"[Title/Abstract] OR "family therap*"[Title/Abstract] OR "group intervent*"[Title/Abstract] OR "group therap*"[Title/Abstract] OR "meditation"[Title/Abstract] OR "metacognitive therap*"[Title/Abstract] OR "metacognitive training"[Title/Abstract] OR "meta-cognitive therap*"[Title/Abstract] OR "meta-cognitive training"[Title/Abstract] or "mindfulness"[Title/Abstract] OR "morita therap*"[Title/Abstract] OR "narrative therap*"[Title/Abstract] OR "problem solv*"[Title/Abstract] OR "psychoanaly*"[Title/Abstract] OR "psychodynamic*"[Title/Abstract] OR "psychoeducat*"[Title/Abstract] OR "psychological treatment*"[Title/Abstract] OR "psychological intervent*"[Title/Abstract] OR "psychosocial treatment*"[Title/Abstract] OR "psychosocial intervent*"[Title/Abstract] OR "psychotherap*"[Title/Abstract] OR "socioenvironmental therap*"[Title/Abstract] OR "social skills training*"[Title/Abstract] OR "supportive therap*"[Title/Abstract] OR "psychiatric rehabili*"[Title/Abstract] OR |

| | |
|---|---|
| | "psychosocial rehabili*"[Title/Abstract] OR "token economy"[Title/Abstract] OR "peer support*"[Title/Abstract] OR "peer deliver*"[Title/Abstract] OR "supported employment"[Title/Abstract] OR "crisis plan*"[Title/Abstract] OR "wellness recovery action planning"[Title/Abstract] OR "illness management"[Title/Abstract] OR "refocus"[Title/Abstract] OR "individual placement and support"[Title/Abstract] OR "supported housing"[Title/Abstract] OR "open dialogue"[Title/Abstract] |
| #3 | "randomized controlled trials as topic"[MeSH Terms] OR "controlled clinical trial"[Publication Type] OR "random*"[Title/Abstract] OR "RCT"[Title/Abstract] or "control*"[Title/Abstract] OR "trial*"[Title/Abstract] OR "condition*"[Title/Abstract] |
| #4 | #1 AND #2 AND #3 |
| #5 | #4 NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms]) |

**Screening and data extraction**

Screening

All search results will be catalogued using EndNote. After removing duplicates, screening and selection of studies will be managed using Rayyan. Eligibility of each study will be determined with the aid of a two-step screening procedure. First, screening of titles and abstracts will be conducted. Second, full-text screening of studies selected in the first screening will be performed. Both the first and second screening will be performed by two independent, blinded reviewers. We will include studies that both reviewers judge to be "included". Prior to the formal screening, our review team will work together to screen a small sample of studies to ensure accuracy and consistency among reviewers. If both reviewers disagree even after discussion, we will consult another reviewer to make a decision. If there are any uncertainties about eligibility for this study, we will ask the authors of the original studies to provide further information. Details of selection process will be presented in the PRISMA flow chart.

Data extraction

Two reviewers will independently extract data from each selected study using a pre-designed form in Microsoft Excel. The following data will be extracted from each included study:

- Publication information: authors name, publication year
- Study characteristics: country in which the study was conducted, study design (type of RCT), number of arms, number randomised to each arm, randomisation method
- Participant demographics: mean age, proportion of female/male, proportion of ethnicity, proportion of first-episode cases, details on diagnosis, method of diagnostic assessment
- Intervention/comparator characteristics: type of intervention (e.g. social skills training, cognitive behavioural therapy), setting/context (outpatient clinic, other facilities, home, or combination), format (individual, group, or combination), intensity and type of contact/support (therapist-led, self-help [no contact/support], or combination; face-to-face, remote [e.g. telephone, e-mail, internet], or combination), inclusion of intervention for partners/family members, expertise of therapist (e.g. doctor, nurse, psychologist), intervention dose (number and frequency of sessions/contacts, time span of the intervention), type of comparator (non-active intervention [e.g. treatment as usual], waiting list, or other non-active interventions [e.g. psychological/pill placebo])
- Outcome measures: primary and secondary outcomes specified and collected, method of collection (self-reported or assessor-rated), and time points reported
- Others: potential conflicts of interest and funding agencies

Before extracting data, a calibration exercise will be undertaken to ensure accuracy and consistency among reviewers. If there is any discrepancy between reviewers even after discussion, we will consult another reviewer in order to reach consensus. If needed, we will ask study authors to obtain additional data and/or further clarification.

**Risk of bias assessment**

The risk of bias for the included studies will be assessed with Revised Cochrane Risk-of-Bias Tool for Randomised Trials (RoB 2). Two reviewers will independently assess the following bias domains:

- Bias arising from the randomisation process
- Bias due to deviations from intended interventions
- Bias due to missing outcome data

- Bias in measurement of the outcome
- Bias in selection of the reported result
- Other biases.

Assessments will be classified into three levels according to the quality classification standards: low risk, some concerns, and high risk of bias. Any disagreements/discrepancies will be resolved through discussion. If necessary, we will contact the study authors for further information. Effects of studies with a high risk of bias in the overall domain will be evaluated by sensitivity analyses.

**Strategy for data synthesis and statistical analysis**

***Characteristics of the included studies***

We will produce descriptive statistics and study population characteristics across all included studies, describing the types of comparisons and other clinical or methodological variables mentioned above.

***Measurement of intervention effect***

The extracted data will be synthesised into a meta-analysis where possible. We will perform standard pairwise meta-analyses with a random-effects model for every comparison with at least two studies. Statistical analysis will be carried out using the Cochrane Collaboration's Review Manager (RevMan) software (version 5.4 for Windows). Acknowledging heterogeneity in psychosocial interventions for schizophrenia, we will perform random effects meta-analyses for each intervention type separately. For continuous outcomes (quality of life, personal recovery, overall functioning, overall psychotic symptoms, and positive/negative symptoms), standardised mean differences with 95% confidence intervals (CIs) will be calculated. For dichotomous outcomes (e.g. hospital admission, severe adverse events, and premature discontinuation), risk ratios with 95% CIs will be calculated. The data for each meta-analysis will be presented in a forest plot.

***Dealing with missing data***

We will assess levels of attrition for included studies, and conduct sensitivity analysis of the impact of including studies with missing data of 20% or more. For all outcomes, we will conduct intention-to-treat analysis wherever possible.

***Assessment of heterogeneity***

Heterogeneity will be evaluated by using the inconsistency index ($I^2$) statistic to describe the percentages of total variation across studies ($I^2 \leq 50\%$ = low; $I^2 > 50\%$ = moderate to high). Where appropriate for pooling effect sizes, a fixed-effects model will be used when heterogeneity is low, and a random-effects model will be used when heterogeneity is moderate to high. If any substantial heterogeneity is observed, we will perform further subgroup analysis.

***Assessment of publication bias***

If a sufficient number of studies (10 or more) are eligible for meta-analysis, funnel plots will be used to assess reporting bias.

***Analysis of subgroups or subsets***

If any substantial heterogeneity is identified, the following potential effect moderators of primary outcomes will be explored by subgroup analyses:

- Intervention setting/context (facility-based [e.g. outpatient clinic] versus others [e.g. home])
- Intervention format (individual versus group)
- Intensity of contact/support (therapist-led versus self-help [no contact/support])
- Mean age of participants (aged ≤35 versus >35 years)
- Country categories (high-income versus low to middle-income countries [based on World Bank income group])

If possible, we will perform some extra subgroup analyses according to the results of heterogeneity and inconsistency. Subgroup differences will be assessed by interaction tests. The

results of subgroup analyses will be reported quoting the $I^2$ statistic and p value, and the interaction test $I^2$ value.

We also plan to perform sensitivity analysis on primary outcomes to observe the effects of excluding studies with high risk of bias in the overall domain, studies focused on first episode cases, and studies focused on treatment-resistant cases.

***Assessment of the confidence in cumulative evidence***

The Grades of Recommendation Assessment, Development and Evaluation (GRADE) approach will be used to rate the overall evidence. Data will be imported from RevMan to the GRADE profiler (GRADEpro) software to produce "summary of findings" tables. These tables will provide key information regarding evidence quality, intervention effect, and a summary of available data on the outcome variables. The quality of the body of evidence will be assessed based on five factors: study limitations, consistency of effect, imprecision, indirectness, and publication bias. Assessments will be judged/categorised as "high", "moderate", "low", and "very low".

## ETHICS AND DISSEMINATION

This study will consist of secondary analyses of existing anonymous data (i.e. primary data will not be collected); hence, no formal ethical review/assessment is required. We plan to disseminate the study findings through conference presentations as well as publications in peer-reviewed journals.

## DISCUSSION

There are two key methodological strengths. First, this study will only include relevant randomised controlled trials in order to avoid sources of bias that are commonly seen in quasi-experimental clinical trials, particularly when employing pre–post study design without control groups. Second, this study will accept all relevant trials from both high-income and low to middle-income countries, without placing restrictions on language of publication. The main strengths listed above will make the study findings applicable to a wide range of countries, have the potential to inform and influence

clinical decision-making, and serve as a guide for planning meaningful mental healthcare resource allocation.

The following methodological limitations must also be taken into consideration. First, we will only include randomised controlled trials in our study. Since many low to middle-income countries still lack sufficient capacity to conduct randomised controlled trials (mainly due to limited available funds, facilities, healthcare professionals), evidence from non-randomised controlled trials is important in these countries. Case-control studies or even observational studies are also important as they reflect real-world data in the community setting. However, since our study will focus on a wide range of psychosocial interventions and accept all relevant trials from both high-income and low to middle-income countries, there is a risk of obtaining too many records and including too many studies in the analysis if we accept non-randomised trials; this would have a serious negative impact on the feasibility of our study. In addition, several existing systematic reviews, focusing on psychosocial interventions for schizophrenia in low- and middle-income countries, have also only accepted randomised controlled trials in their analyses.[28, 37] Thus, we decided to limit the scope of our study to randomised controlled trials. Nevertheless, when interpreting the results, we need to be aware that the exclusion of non-randomised controlled trials may lead to a loss of data from the real world of clinical practice. Second, our secondary outcome regarding negative symptoms will be based on data from validated clinical instruments, but some of the commonly-used instruments (e.g. negative symptom subscale of the Positive and Negative Syndrome Scale, the Scale for the Assessment of Negative Symptoms) include some aspects not relevant to the current conceptualisation of negative symptoms (blunted affect, alogia, anhedonia, asociality, and avolition).[2] Thus, this study cannot properly assess some of the core symptomatic outcomes, especially negative symptoms.

Findings of this study may be limited by publication bias, study heterogeneity, the measurements used to assess quality of life (primary outcome), and the methodological quality of included studies. These limitations will be addressed with the Revised Cochrane Risk-of-Bias Tool for Randomised Trials (RoB 2), and the credibility of the results will be assessed using the Grades of Recommendation Assessment, Development and Evaluation (GRADE) approach.

To the best of our knowledge, this proposed systematic review and meta-analysis will be the first to focus on the efficacy of all types of psychosocial interventions for community-dwelling individuals with schizophrenia and related disorders. Through this review, an overall picture of available evidence on the efficacy of psychosocial interventions in this population will be available. Additional analyses will also identify effective psychosocial interventions for specific populations, intervention types (including delivery methods), and so on, associated with intervention effectiveness. Such findings will serve to augment existing evidence that can inform service users, mental health professionals, and policy makers about choices in treatment/care, the development of new interventions, and the meaningful allocation of mental healthcare resources for managing community-dwelling individuals with schizophrenia.

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**Authors' contributions**: YS, HT, HI, and NY designed the study protocol, and drafted the manuscript. HN, FY, TG, YK, AT, HS, and YI contributed with clinical and methodological input in planning the protocol. All authors critically revised the draft and contributed to and have approved the final manuscript.

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**Competing interests statement**: HI has received consulting fees from Mitsubishi-Tanabe Pharma; honoraria for lectures from Mochida Pharmaceutical, Otsuka Pharmaceutical, and Kyowa Pharmaceutical. TG has received honorarium for writing from Igaku-Shoin. AT has received honoraria for lectures from Mitsubishi-Tanabe Pharma, Sumitomo Dainippon Pharma, and Otsuka Pharmaceutical. HS has received honoraria for lectures/presentations from Pfizer, Sanofi, Alexion Pharmaceuticals, Novo Nordisk Pharma, Sumitomo Dainippon Pharma, JCR Pharmaceuticals, Miyazaki City and Country Medical Association, Children's Cancer Association of Japan, and Miyazaki Health Promotion Association; payment for expert testimony from Kyushu Conference for School Physical Examination, Miyazaki City and Country Medical Association, and Miyazaki Prefectural Health Foundation; he is a leader of Committee for Growth Charts at School of Miyazaki City and Country Medical Association, and Specialist Committee on Newborn Screening Tests of Miyazaki Prefectural Health Foundation. YI has received contracts from Tsumura; honoraria for lectures from Otsuka Pharmaceutical, Sumitomo Dainippon Pharma, Meiji Seika Pharma, Tsumura, Yoshitomiyakuhin Corporation, Takeda Pharmaceutical, Eisai, Mochida Pharmaceutical, Kyowa Kirin, MSD, and Towa Pharmaceutical. NY has received a book royalty from Medical Friend; honoraria for lectures from Gakken Medical Support, Eisai, Meiji Seika Pharma, Mitsubishi-Tanabe Pharma, and Mochida Pharmaceutical; honoraria for writings from Igaku-Shoin, Nikkei Business Publications, and Maruzen Publishing; he is a Diplomate of the Academy of Cognitive and Behavioral

Therapies, Secretary Board Member of the Japanese Association for Cognitive Therapy, and Member of the Japan Clinical Guideline Development Group for Anxiety Disorders and Obsessive-Compulsive Disorder. All of the other authors declare that they have no competing interests.

**Patient consent for publication**: Not required.

**Patient and public involvement statement**: Neither patients nor the public was involved in the design, conduct, reporting, or dissemination plans of this study.

**Provenance and peer review**: Not commissioned; externally peer reviewed.

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**Supplementary Appendix 1.** Type and description of psychosocial interventions

| Type of intervention | Description |
|---|---|
| Acceptance and commitment therapy | A third-generation behavioural therapy that incorporates acceptance and mindfulness-based strategies to help individuals in overcoming negative thoughts and feelings. |
| Assertive community treatment | An intensive, outreach-oriented, community-based model that serves as a platform for integrating elements of several psychosocial interventions to provide clinical assessments and crisis interventions, along with psychosocial and functional assistance with comprehensive community care delivered by a multidisciplinary team. |
| Case management | Each person is usually assigned to a case manager who contacts the person regularly and can provide more intensive support in case of particularly acute needs. |
| Cognitive adaptation training | Employs environmental supports to target severe functional impairments associated with schizophrenia. These supports include techniques such as labelling and utilisation of signs and alarms in an individual's environment to assist in activities of daily living, and encourage self-care and medication management. |
| Cognitive behavioural therapy | Focuses on the relationship among thoughts, emotions, and behaviours and teaches individuals coping skills to manage illness-related distress, recognize triggers related to symptom exacerbation, and evaluate maladaptive beliefs. |
| Cognitive training | A programme of regular activities aimed at maintaining and improving cognitive abilities such as memory and attention, language expression and logic, coordination, and cognitive rehabilitation. |
| Cognitive remediation | Use of cognitive practices and teaching strategies to target cognitive impairments related to schizophrenia (e.g., memory, attention, executive functioning, social cognition). Cognitive remediation can be done on a computer or with paper and pencil. |
| Family interventions | An intervention involving the relatives of the person, which can have several different aims. These include construction of |

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| | an alliance with relatives who care for the person with schizophrenia, reduction of adverse family atmosphere, enhancement of the capacity of relatives to anticipate and solve problems, maintenance of reasonable expectations for patient performance, and attainment of desirable change in relatives' behaviour and belief systems. |
| Illness management and recovery | Teaches illness self-management strategies to people with schizophrenia, and comprises five empirically based strategies: psychoeducation to improve understanding about mental illness and treatment; cognitive-behavioural approaches to improve medication adherence; training in the prevention of relapses; social skills training to buffer stress and strengthen social support; and teaching coping skills to reduce the distress and severity of symptoms. |
| Integrated interventions | A combination of different treatments (e.g. individual cognitive behavioural therapy plus family intervention plus assertive outreach). |
| Interventions for physical health problems | Aims to treat/manage co-occurring physical health problems (e.g. psychosocial weight loss intervention) |
| Interventions for comorbid psychiatric disorders | Aims to treat/manage comorbid psychiatric disorders (e.g. depression, substance use disorder, post-traumatic stress disorder) |
| Metacognitive training | A form of cognitive behavioural therapy that focuses specifically on meta-cognitions. It aims to convince individuals to gather more information, that is, to diminish a jumping to conclusions bias, and to reduce overconfidence in errors, especially for momentous decisions. |
| Mental health trialogues | A community forum where service users, carers, friends, mental health workers, and others with an interest in mental health participate in an open dialogue. Meetings address different topics. Trialogues facilitate a discrete and independent form of acquisition and production of knowledge, and drive recovery-oriented changes in communication and structures. |
| Mindfulness-based interventions | Consist of guided meditation followed by reflective group discussion aimed at facilitating understanding or |

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| | metacognitive insight. Individuals bring full awareness to difficult voices, feelings, thoughts, and images, and also become aware of habitual coping reactions, safety behaviours, and their effects. They practise letting go of these reactions and learn to allow and observe psychotic experiences without reacting. Meditation and discussion lead to the insight that struggling, judging, and ruminating on psychotic experience creates distress, while mindful observation and acceptance of psychotic experience is empowering and calming. |
| Motivational interviewing | A client-centred, directive method, through which individuals are engaged in strategically directed conversations about their problems. It explores personal ideas and ambivalences, eliciting and selectively reinforcing so-called change talk, by which discrepancies between the present behaviour and the individual's own future goals are amplified. The overall goal is to increase the individual's intrinsic motivation for change. In individuals with schizophrenia, it can be used to focus on specific impacts of illness behaviours on the individuals, and provide them with opportunities to engage and discuss their ambivalent attitudes towards their illness behaviours, treatments, and possible consequences of non-adherence. |
| Open dialogue | A model of mental health care that involves a consistent family and social network approach where all treatment is carried out via a whole system/network meeting, which always includes the individuals with schizophrenia. Key principles and elements include providing immediate help, involving the social network, flexibility and continuity of the treatment team, and a particular emphasis on the creation of dialogue within network meetings. |
| Psychoeducation | Psychoeducation can be defined as the education of a person with schizophrenia in subject areas that serve the goals of treatment and rehabilitation. In individuals with schizophrenia, it usually covers the following topics: symptoms of psychosis, models of psychosis, effects and side-effects of medication, maintenance of medication, |

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| | psychotherapy for psychosis, early symptoms of relapse, and relapse prevention. |
| REFOCUS | Manualised intervention aims to increase the recovery orientation of community adult mental health teams. Staff are trained and supported through reflection sessions and supervision to use three working practices. First, to maximize person-centred care planning, staff discuss the values and treatment preferences of the service user, using conversational, narrative and visual approaches. Second, staff use a standardized assessment to identify the service user's strengths, so that care planning will be focused on amplifying strengths and the ability to access community supports, as well as focusing on deficit amelioration. Third, staff support active goal-striving by the service user towards his/her personally valued goals. |
| Relapse prevention programmes | Interventions that generally include education for recognising early symptoms of relapse, a system of symptoms monitoring, and a crisis plan and intervention in case symptoms increase over a certain threshold. |
| Relatives group | Support groups for relatives of the person with schizophrenia, where they meet without the person with the aim of sharing experiences and providing mutual support and empathic discussion about caregiving experiences. The groups are usually peer led, without the direct involvement of an expert. The peer leader facilitates empathic and supportive responses to individual needs and concerns. |
| Peer-support | Support or services provided to people with schizophrenia by other people who have experienced schizophrenia themselves. It may promote self-efficacy and hope through sharing experiential knowledge and through modelling recovery and coping strategies |
| Skills training | Aims to improve social interactions, independent living, and other outcomes that have clear relevance to community functioning. Skills training programs vary widely in content but typically include a focus on interpersonal skills and share several key elements, including behaviourally based |

| | |
|---|---|
| | instruction, role modelling, rehearsal, corrective feedback, and positive reinforcement. |
| Supported housing | An approach to helping people with schizophrenia establish and maintain stable residences with the ongoing support of mental health professionals |
| Supported employment | Assists individuals with schizophrenia in finding competitive employment, supports them in that employment, and teaches them skills and strategies to help maintain that employment (also known as individual placement and support). The key elements include individually tailored job development, rapid job search, availability of ongoing job supports, and integration of vocational and mental health services. |
| Wellness recovery action planning | The wellness recovery action planning (WRAP) tools and processes support self-management with a specific focus on recovery-oriented mental health services. WRAP is used to create recovery plans by guiding individuals and groups of people to reflect on what has assisted them in staying well in the past, and to consider strategies that assisted others with their recovery. Planning tools focus on self-management, from identifying fundamental strategies that enhance daily well-being to recognizing and dealing with triggers to distress through crisis planning. |

**Supplementary Appendix 2.** Search strategy in different databases

PubMed

| Line | Query |
|---|---|
| 1 | "schizophrenia spectrum and other psychotic disorders"[MeSH Terms] OR "schizo*"[Title/Abstract] OR "psychotic*"[Title/Abstract] OR "psychosis"[Title/Abstract] OR "psychoses"[Title/Abstract] |
| 2 | "psychotherapy"[MeSH Terms] OR "psychoanalysis"[MeSH Terms] OR "counseling"[MeSH Terms] OR "community mental health services"[Mesh Terms] OR "psychiatric rehabilitation"[Mesh Terms] OR "acceptance and commitment therap*"[Title/Abstract] OR "assertive communit*"[Title/Abstract] OR "behavior modificat*"[Title/Abstract] OR "behavior regulat*"[Title/Abstract] OR "behavior therap*"[Title/Abstract] OR "behaviour modificat*"[Title/Abstract] OR "behaviour regulat*"[Title/Abstract] OR "behaviour therap*"[Title/Abstract] OR "behavioral modificat*"[Title/Abstract] OR "behavioral regulat*"[Title/Abstract] OR "behavioral therap*"[Title/Abstract] OR "behavioural modificat*"[Title/Abstract] OR "behavioural regulat*"[Title/Abstract] OR "behavioural therap*"[Title/Abstract] OR "cognitive behavio*"[Title/Abstract] OR "cognitive intervent*"[Title/Abstract] OR "cognitive rehabilitat*"[Title/Abstract] OR "cognitive remediat*"[Title/Abstract] OR "cognitive technique*"[Title/Abstract] OR "cognitive therap*"[Title/Abstract] OR "cognitive treatment*"[Title/Abstract] OR "compassion focused"[Title/Abstract] OR "conversational therap*"[Title/Abstract] OR "conversion therap*"[Title/Abstract] OR "counseling"[Title/Abstract] OR "counselling"[Title/Abstract] OR "emotion focused"[Title/Abstract] OR "emotionally focused"[Title/Abstract] OR "emotional focused"[Title/Abstract] OR "exposure therap*"[Title/Abstract] OR "family intervent*"[Title/Abstract] OR "family therap*"[Title/Abstract] OR "group intervent*"[Title/Abstract] OR "group therap*"[Title/Abstract] OR "meditation"[Title/Abstract] OR "metacognitive therap*"[Title/Abstract] OR "metacognitive training"[Title/Abstract] OR "meta-cognitive therap*"[Title/Abstract] OR "meta-cognitive training"[Title/Abstract] or "mindfulness"[Title/Abstract] OR "morita therap*"[Title/Abstract] OR "narrative therap*"[Title/Abstract] OR "problem solv*"[Title/Abstract] OR "psychoanaly*"[Title/Abstract] OR "psychodynamic*"[Title/Abstract] OR "psychoeducat*"[Title/Abstract] OR "psychological treatment*"[Title/Abstract] OR "psychological intervent*"[Title/Abstract] OR "psychosocial treatment*"[Title/Abstract] OR "psychosocial intervent*"[Title/Abstract] OR "psychotherap*"[Title/Abstract] OR |

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|---|---|
| | "socioenvironmental therap*"[Title/Abstract] OR "social skills training*"[Title/Abstract] OR "supportive therap*"[Title/Abstract] OR "psychiatric rehabili*"[Title/Abstract] OR "psychosocial rehabili*"[Title/Abstract] OR "token economy"[Title/Abstract] OR "peer support*"[Title/Abstract] OR "peer deliver*"[Title/Abstract] OR "supported employment"[Title/Abstract] OR "advance directive*"[Title/Abstract] OR "crisis plan*"[Title/Abstract] OR "wellness recovery action planning"[Title/Abstract] OR "illness management"[Title/Abstract] OR "refocus"[Title/Abstract] OR "individual placement and support"[Title/Abstract] OR "supported housing"[Title/Abstract] OR "open dialogue"[Title/Abstract] OR "community treatment order*"[Title/Abstract] |
| 3 | "randomized controlled trials as topic"[MeSH Terms] OR "controlled clinical trial"[Publication Type] OR "random*"[Title/Abstract] OR "RCT"[Title/Abstract] or "control*"[Title/Abstract] OR "trial*"[Title/Abstract] OR "condition*"[Title/Abstract] |
| 4 | #1 AND #2 AND #3 |
| 5 | #4 NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms]) |

Embase (via Elsevier)

| Line | Query |
|---|---|
| #1 | 'psychosis'/exp OR (schizo* OR psychotic* OR psychosis OR psychoses):ti,ab |
| #2 | 'psychotherapy'/exp OR 'psychoanalysis'/exp OR 'counseling'/exp OR 'community mental health service'/exp or 'psychosocial rehabilitation'/exp OR (acceptance near/2 commitment* OR assertive* near/1 communit* OR (behavior* or behaviour*) near/1 (modificat* or regulat* or therap*) OR cognit* near/2 (behavio* or intervent* or rehabilitat* or remediat* or technique* or therap* or treatment*) OR compassion* near/1 focused* OR (conversation* or conversion* or supportive or socioenvironment*) near/1 therap* OR counse?ing OR emotion* near/1 focused* OR exposure near/1 therap* OR (family or group) near/1 (intervent* or therap*) OR meditation* OR (metacognitive or meta-cognitive) near/1 (therap* or training*) OR mindfulness OR morita near/1 therap* OR narrative near/1 therap* OR problem near/1 solv* OR psychoanaly* OR psychodynamic* OR psychoeducat* OR psychological near/1 (treatment* or intervent*) OR psychosocial near/1 (treatment* or intervent*) OR psychotherap* OR social near/1 skill* near/1 training* OR (psychosocial* or psychiatric*) near/1 rehabilitat*<br><br>OR token near/1 economy OR peer near/1 support* OR peer near/1 deliver* OR supported near/1 employment OR advance near/1 directive* OR crisis near/1 plan* |

| | |
|---|---|
| | OR 'wellness recovery action planning' OR 'illness management and recovery program' OR refocus OR 'individual placement and support' OR supported near/1 housing OR 'open dialogue' OR 'community treatment' near/1 order*):ti,ab |
| #3 | 'controlled clinical trial'/exp OR (random* or control* or trial* or condition* or rct):ti,ab |
| #4 | #1 AND #2 AND #3 |
| #5 | #4 NOT ('animal experiment'/de NOT ('human experiment'/de OR 'human'/de)) |

PsycINFO (via EBSCO host)

| Line | Query |
|---|---|
| S1 | DE "Schizophrenia" OR DE "Acute Schizophrenia" OR DE "Catatonic Schizophrenia" OR DE "Paranoid Schizophrenia" OR DE "Process Schizophrenia" OR DE "Schizoaffective Disorder" OR DE "Schizophrenia (Disorganized Type)" OR DE "Schizophreniform Disorder" OR DE "Undifferentiated Schizophrenia" DE "Delusions" OR TI (schizo* OR psychotic* OR psychosis OR psychoses) OR AB (schizo* OR psychotic* OR psychosis OR psychoses) |
| S2 | DE "Psychotherapy" OR DE "Analytical Psychotherapy" OR DE "Client Centered Therapy" OR DE "Conversion Therapy" OR "Emotion Focused Therapy" OR DE "Group Psychotherapy" OR DE "Individual Psychotherapy" OR DE "Narrative Therapy" OR DE "Psychoanalysis" OR DE "Psychodynamic Psychotherapy" OR DE "Psychotherapeutic Counseling" OR DE "Psychotherapeutic Techniques" OR DE "Supportive Psychotherapy" OR DE "Psychosocial Rehabilitation" OR DE "Psychosocial Readjustment" OR DE "Therapeutic Social Clubs" OR DE "Vocational Rehabilitation" OR DE "Community Mental Health Services" OR DE "Community Services" OR DE "Community Welfare Services" OR DE "Emergency Services" OR DE "Home Care" OR DE "Home Visiting Programs" OR DE "Public Health Services" OR DE "Mental Health Services" OR MM "Assertive Community Treatment" OR TI ("acceptance and commitment therap*" OR "analytical psychotherap*" OR "assertive communit*" OR "behavior modificat*" OR "behaviour regulat*" OR "behavior therap*" OR "behaviour modificat*" OR "behaviour regulat*" OR "behaviour therap*" OR "behavioral modificat*" OR "behavioral regulat*" OR "behavioral therap*" OR "behavioural modificat*" OR "behavioural regulat*" OR "behavioural therap*" OR "cognitive behavio*" OR "cognitive intervent*" OR "cognitive rehabilit*" OR "cognitive remediat*" OR "cognitive technique*" OR "cognitive therap*" OR "cognitive treatment*" OR "compassion focused" OR "conversational therap*" OR "conversion therap*" OR "counseling" OR "counselling" OR "emotion |

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|---|---|
| | focused" OR "emotionally focused" OR "emotional focused" OR "exposure therap*" OR "expressive psychotherap*" OR "family intervent*" OR "family therap*" OR "group intervention*" OR "group psychotherap*" OR "group therap*" OR "meditation" OR "metacognitive therap*" OR "metacognitive training" OR "meta-cognitive therap*" OR "meta-cognitive training" OR "mindfulness" OR "morita therap*" OR "narrative therap*" OR "problem solv*" OR "psychiatric rehabili*" OR "psychoanaly*" OR "psychodynamic" OR "psychoeducat*" OR "psychogical treatment*" OR "psychological intervent*" OR "psychosocial treatment*" OR "psychosocial intervent*" OR "psychosocial rehabili*" OR "psychotherap*" OR "socioenvironmental therap*" OR "social skills training" OR "supportive therap*" OR "token economy" OR "peer support*" OR "peer deliver*" OR "supported employment" OR "advance directive*" OR "crisis plan*" OR "wellness recovery action planning" OR "illness management and recovery program" OR "refocus" OR "individual placement and support" OR "supported housing" OR "open dialogue" OR "community treatment order*") OR AB ("acceptance and commitment therap*" OR "analytical psychotherap*" OR "assertive communit*" OR "behavior modificat*" OR "behaviour regulat*" OR "behavior therap*" OR "behaviour modificat*" OR "behaviour regulat*" OR "behaviour therap*" OR "behavioral modificat*" OR "behavioral regulat*" OR "behavioral therap*" OR "behavioural modificat*" OR "behavioural regulat*" OR "behavioural therap*" OR "cognitive behavio*" OR "cognitive intervent*" OR "cognitive rehabilit*" OR "cognitive remediat*" OR "cognitive technique*" OR "cognitive therap*" OR "cognitive treatment*" OR "compassion focused" OR "conversational therap*" OR "conversion therap*" OR "counseling" OR "counselling" OR "emotion focused" OR "emotionally focused" OR "emotional focused" OR "exposure therap*" OR "expressive psychotherap*" OR "family intervent*" OR "family therap*" OR "group intervention*" OR "group psychotherap*" OR "group therap*" OR "meditation" OR "metacognitive therap*" OR "metacognitive training" OR "meta-cognitive therap*" OR "meta-cognitive training" OR "mindfulness" OR "morita therap*" OR "narrative therap*" OR "problem solv*" OR "psychiatric rehabili*" OR "psychoanaly*" OR "psychodynamic" OR "psychoeducat*" OR "psychological treatment*" OR "psychological intervent*" OR "psychosocial treatment*" OR "psychosocial intervent*" OR "psychosocial rehabili*" OR "psychotherap*" OR "socioenvironmental therap*" OR "social skills training" OR "supportive therap*" OR "token economy" OR "peer support*" OR "peer deliver*" OR "supported employment" OR "advance directive*" OR "crisis plan*" OR "wellness recovery action planning" OR "illness management and recovery program" |

| | |
|---|---|
| | OR "refocus" OR "individual placement and support" OR "supported housing" OR "open dialogue" OR "community treatment order*") |
| S3 | DE "Clinical Trials" OR DE "Randomized Controlled Trials" OR DE "Randomized Clinical Trials" OR TI (random* OR RCT or control* OR trial* OR condition*) OR AB (random* OR RCT or control* OR trial* OR condition*) |
| S4 | S1 AND S2 AND S3 |
| S5 | S4 NOT (DE "Animals" OR DE "Animal Research" OR TI "animal model*" OR AB "animal model*") |

CINAHL (via EBSCO host)

| Line | Search query |
|---|---|
| S1 | MH "Schizophrenia+" OR MH "Schizoaffective Disorder" OR MH "Delusions" OR TI (schizo* OR psychotic* OR psychosis OR psychoses) OR AB (schizo* OR psychotic* OR psychosis OR psychoses) |
| S2 | MH "Psychotherapy+" OR MH "Psychoanalysis" OR MH "Psychological Processes and Principles+" OR MH "Rehabilitation, Psychosocial+" OR MM "Community Mental Health Services" OR TI ("acceptance and commitment therap*" OR "analytical psychotherap*" OR "assertive communit*" OR "behavior modificat*" OR "behaviour regulat*" OR "behavior therap*" OR "behaviour modificat*" OR "behaviour regulat*" OR "behaviour therap*" OR "behavioral modificat*" OR "behavioral regulat*" OR "behavioral therap*" OR "behavioural modificat*" OR "behavioural regulat*" OR "behavioural therap*" OR "cognitive behavio*" OR "cognitive intervent*" OR "cognitive rehabilit*" OR "cognitive remediat*" OR "cognitive technique*" OR "cognitive therap*" OR "cognitive treatment*" OR "compassion focused" OR "conversational therap*" OR "conversion therap*" OR "counseling" OR "counselling" OR "emotion focused" OR "emotionally focused" OR "emotional focused" OR "exposure therap*" OR "expressive psychotherap*" OR "family intervent*" OR "family therap*" OR "group intervention*" OR "group psychotherap*" OR "group therap*" OR "meditation" OR "metacognitive therap*" OR "metacognitive training" OR "meta-cognitive therap*" OR "meta-cognitive training" OR "mindfulness" OR "morita therap*" OR "narrative therap*" OR "problem solv*" OR "psychiatric rehabili*" OR "psychoanaly*" OR "psychodynamic" OR "psychoeducat*" OR "psychogical treatment*" OR "psychological intervent*" OR "psychosocial treatment*" OR "psychosocial intervent*" OR "psychosocial rehabili*" OR "psychotherap*" OR "socioenvironmental therap*" OR "social skills training" OR "supportive therap*" OR "token economy" OR "peer support*" OR "peer deliver*" |

| | |
|---|---|
| | OR "supported employment" OR "advance directive*" OR "crisis plan*" OR "wellness recovery action planning" OR "illness management and recovery program" OR "refocus" OR "individual placement and support" OR "supported housing" OR "open dialogue" OR "community treatment order*") OR AB ("acceptance and commitment therap*" OR "analytical psychotherap*" OR "assertive communit*" OR "behavior modificat*" OR "behaviour regulat*" OR "behavior therap*" OR "behaviour modificat*" OR "behaviour regulat*" OR "behaviour therap*" OR "behavioral modificat*" OR "behavioral regulat*" OR "behavioral therap*" OR "behavioural modificat*" OR "behavioural regulat*" OR "behavioural therap*" OR "cognitive behavio*" OR "cognitive intervent*" OR "cognitive rehabilit*" OR "cognitive remediat*" OR "cognitive technique*" OR "cognitive therap*" OR "cognitive treatment*" OR "compassion focused" OR "conversational therap*" OR "conversion therap*" OR "counseling" OR "counselling" OR "emotion focused" OR "emotionally focused" OR "emotional focused" OR "exposure therap*" OR "expressive psychotherap*" OR "family intervent*" OR "family therap*" OR "group intervention*" OR "group psychotherap*" OR "group therap*" OR "meditation" OR "metacognitive therap*" OR "metacognitive training" OR "meta-cognitive therap*" OR "meta-cognitive training" OR "mindfulness" OR "morita therap*" OR "narrative therap*" OR "problem solv*" OR "psychiatric rehabili*" OR "psychoanaly*" OR "psychodynamic" OR "psychoeducat*" OR "psychological treatment*" OR "psychological intervent*" OR "psychosocial treatment*" OR "psychosocial intervent*" OR "psychosocial rehabili*" OR "psychotherap*" OR "socioenvironmental therap*" OR "social skills training" OR "supportive therap*" OR "token economy" OR "peer support*" OR "peer deliver*" OR "supported employment" OR "advance directive*" OR "crisis plan*" OR "wellness recovery action planning" OR "illness management and recovery program" OR "refocus" OR "individual placement and support" OR "supported housing" OR "open dialogue" OR "community treatment order*") |
| S3 | MH "Clinical Trials+" OR MH "Random Assignment" OR PT Clinical Trial OR TI (random* OR RCT or control* OR trial* OR condition*) OR AB (random* OR RCT or control* OR trial* OR condition*) |
| S4 | S1 AND S2 AND S3 |
| S5 | S4 NOT ((MH "Animals+" OR MM "Animal Studies" OR TI "animal model*" OR AB "animal model*") NOT MM "Human") |

Cochrane Central Register of Controlled Trials (CENTRAL)

| Line | Query |
|---|---|
| #1 | [mh "Schizophrenia Spectrum and Other Psychotic Disorders"] or (schizo* or psychotic* or psychosis or psychoses):ti,ab,kw |
| #2 | [mh Psychotherapy] or [mh Psychoanalysis] or [mh Counseling] or [mh "community mental health services"] or [mh "psychiatric rehabilitation"] or ("acceptance and commitment" or (analytical next psychotherap*) or "assertive community" or ((behavior* or behaviour*) next (modificat* or regulat* or therap*)) or (cognit* next (behavio* or intervent* or rehabili* or remediat* or technique* or therap* or treatment*)) or (compassion* next focused) or ((conversation* or conversion*) next therap*) or counse*ing or (emotion* next focused) or (exposure next therap*) or ((family or group) next (intervent* or therap*)) or meditation* or ((metacognitiv* or meta-cognitiv*) next (therap* or training*)) or mindfulness or (morita next therap*) or (narrative next therap*) or (problem next solv*) or psychoanaly* or psychodynamic* or psychoeducat* or psychological next (treatment* or intervent*) or psychosocial next (treatment* or intervent*) or psychotherap* or (social* next skill* next training*) or ((supportive* or socioenvironment*) next therap*) or ((psychiatric* or psychosocial*) next rehabili*) or "community mental health service" or "token economy" or (peer next support*) or (peer next deliver*) or "supported employment" or (advance next directive*) or (crisis next plan*) or "wellness recovery action planning" or "illness management and recovery program" or "refocus" or "individual placement and support" or "supported housing" or "open dialogue" or (community next treatment next order*)):ti,ab,kw |
| #3 | [mh "Controlled Clinical Trial"] or [mh "Randomized Controlled Trials as Topic"] or (control* or trial* or condition* or random* or rct):ti,ab,kw,pt |
| #4 | #1 and #2 and #3 in Trials |

ClinicalTrials.gov

| Search field | Query |
|---|---|
| Condition or disease | schizo* OR psychotic* OR psychosis OR psychoses |
| Other terms | random OR rct |
| Study type | Interventional studies(clinical trials) |
| Study Results | All Studies |
| Age Group | Adult (18-64) OR Older Adult (65+) |
| Intervention/treatment | assertive community OR cognitive behavio* OR counseling OR family therap* OR psychoeducat* OR psychosocial intervention* OR psychotherap* OR social skills training OR supportive therap* |

World Health Organisation International Clinical Trials Registry Platform (ICTRP)

| Search field | Query |
|---|---|
| Condition | schizo* OR psychotic* OR psychosis OR psychoses |
| Intervention | assertive community OR cognitive behavio* OR counseling OR family therap* OR psychoeducat* OR psychosocial intervention* OR psychotherap* OR social skills training OR supportive therap* |
| Recruitment status | ALL |

OpenGrey

| |
|---|
| (schizo* OR psychotic* OR psychosis OR psychoses) AND ("assertive community" OR counseling OR "family therap*" OR "behavioral therap*" OR psychoeducat* OR psychotherap* OR "supportive therap*") AND (random* OR rct) |

**PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol***

| Section and topic | Item No | Checklist item | Information reported |
|---|---|---|---|
| **ADMINISTRATIVE INFORMATION** | | | |
| Title: | | | |
| Identification | 1a | Identify the report as a protocol of a systematic review | Yes |
| Update | 1b | If the protocol is for an update of a previous systematic review, identify as such | N/A |
| Registration | 2 | If registered, provide the name of the registry (such as PROSPERO) and registration number | Yes |
| Authors: | | | |
| Contact | 3a | Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author | Yes |
| Contributions | 3b | Describe contributions of protocol authors and identify the guarantor of the review | Yes |
| Amendments | 4 | If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments | Yes |
| Support: | | | |
| Sources | 5a | Indicate sources of financial or other support for the review | Yes |
| Sponsor | 5b | Provide name for the review funder and/or sponsor | Yes |
| Role of sponsor or funder | 5c | Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol | Yes |
| **INTRODUCTION** | | | |
| Rationale | 6 | Describe the rationale for the review in the context of what is already known | Yes |
| Objectives | 7 | Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) | Yes |
| **METHODS** | | | |
| Eligibility criteria | 8 | Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review | Yes |
| Information sources | 9 | Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage | Yes |
| Search strategy | 10 | Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be | Yes |

| | | | |
|---|---|---|---|
| | | repeated | |
| Study records: | | | Yes |
| Data management | 11a | Describe the mechanism(s) that will be used to manage records and data throughout the review | Yes |
| Selection process | 11b | State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis) | Yes |
| Data collection process | 11c | Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators | Yes |
| Data items | 12 | List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications | Yes |
| Outcomes and prioritization | 13 | List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale | Yes |
| Risk of bias in individual studies | 14 | Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis | Yes |
| Data synthesis | 15a | Describe criteria under which study data will be quantitatively synthesised | Yes |
| | 15b | If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as $I^2$, Kendall's $\tau$) | Yes |
| | 15c | Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression) | Yes |
| | 15d | If quantitative synthesis is not appropriate, describe the type of summary planned | |
| Meta-bias(es) | 16 | Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies) | Yes |
| Confidence in cumulative evidence | 17 | Describe how the strength of the body of evidence will be assessed (such as GRADE) | Yes |

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

*From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.*