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This is a preliminary, unedited version of a manuscript that has been accepted for publication in the Brazilian Journal of Psychiatry. As a service to our readers, we are providing this early version of the manuscript. The manuscript will still undergo copyediting, typesetting, and review of the resulting proof before it is published in final form. The final version may present slight differences in relation to the present version.

Optimizing Early Psychosis Care through Family Psychoeducation: A Systematic Review and Meta-Analysis

Thiago A. Benazzi[a,b] , Vicente R. Arturi[b], Luis H. T. da Silva[b,c], Daniel P. Baldez[a,b] , Gislaine Baroni[a,b] , Clarissa S. Gama[a,b,c, *]

a Graduate Program in Psychiatry and Behavioral Sciences, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil.
b Laboratory of Molecular Psychiatry, Centro de Pesquisa Experimental, Hospital de Clínicas de Porto Alegre, Porto Alegre, RS, Brazil.
c Department of Psychiatry, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil.

* Corresponding author: Clarissa S. Ga
Hospital de Clínicas de Porto Alegre/CPE, Molecular Psychiatry Laboratory,
Rua Ramiro Barcelos, 2350, Prédio Anexo, Porto Alegre, RS
90035-903, Brazil.
E-mail address: cgama@hcpa.edu.br

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Abstract

Family psychoeducation is a key psychosocial strategy in early psychosis care, but its specific effects for relatives of people with first-episode psychosis (FEP) remain uncertain. We conducted a systematic review and meta-analysis, registered in PROSPERO (CRD42024585814) and following PRISMA, to evaluate clinical and caregiver outcomes. Randomized and nonrandomized trials comparing structured programs with treatment as usual or other interventions were searched in PubMed, Embase, Scopus, and the Cochrane Library to April 2024. Fifteen studies (n=2,271) met criteria. Pooled results showed benefits for patients: lower risk of psychiatric hospitalization (risk ratio 0.64; 95% CI 0.45–0.90) and shorter inpatient stays (standardized mean difference [SMD] −0.29; 95% CI −0.50 to −0.09). Symptoms also improved, with reductions in general psychopathology (SMD −0.45; 95% CI −0.80 to −0.09), positive symptoms (SMD −0.36; 95% CI −0.63 to −0.09), and negative

symptoms (SMD −0.32; 95% CI −0.49 to −0.15). Effects on negative symptoms persisted at two-year follow-up. No significant effects emerged for functioning or caregiver burden. Overall, family psychoeducation is a low-cost, feasible intervention that improves clinical outcomes and reduces service utilization in FEP, supporting incorporation into early-intervention programs.

Keywords: Caregivers' psychoeducation, first-episode psychosis, family psychoeducation

1. INTRODUCTION

The first episode of psychosis is characterized by the onset of symptoms lasting more than seven days in previously healthy individuals [1]. Its annual incidence ranges from 10 to 82 per 100,000 people [2,3,4,5,6,7,8]. The clinical management of an individual experiencing a first psychotic episode requires careful diagnostic evaluation to understand possible differential diagnoses and enable timely and targeted early intervention. Differentiating primary causes such as schizophrenia and mood disorders from secondary causes such as substance-induced psychosis or psychosis due to other medical conditions—including neurological, autoimmune, metabolic, and infectious diseases—is a crucial step in therapeutic planning [9]. Initially, the primary goal is to ensure the individual's safety and remission of psychotic symptoms [10]. This period is challenging for patients, their families, and health professionals due to its potentially long-lasting implications. Delays in initiating treatment may lead to poorer long-term outcomes regarding symptom severity and global functioning [11,12].

Specialized early-intervention services, when compared with treatment as usual, are associated with better outcomes, including lower treatment discontinuation and hospitalization rates [10]. One key approach offered in such services is psychoeducation, defined as the structured and systematic delivery of educational information about symptoms, potential underlying disorders, and treatment strategies. Its goal is to provide education about the psychotic syndrome, its consequences, and possible resulting diagnoses. This systematic education helps patients and their families develop stronger tools to cope more effectively both acutely and in the long term [13,14].

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When applied to individuals with established diagnoses of schizophrenia or bipolar disorder, psychoeducation reduces relapse rates and improves medication adherence, quality of life, and illness insight [13,15,16,17]. Among relatives and caregivers, psychoeducation can positively influence the course of treatment by reducing relapse rates, supporting the development of effective coping strategies, and aiding the early detection of prodromal signs of relapse [13]. In the context of first-episode psychosis, caregivers report higher levels of distress and greater burden compared to relatives of individuals with chronic mental illnesses [18]. Nevertheless, strategies specifically designed to provide psychoeducation to family members and caregivers in the setting of a first psychotic episode remain scarce in the literature [19,20,21].

The objective of this study is to conduct a systematic review with meta-analysis to evaluate the potential benefits of psychoeducational interventions for family members and caregivers of individuals diagnosed with first-episode psychosis or early psychosis as adjuncts to pharmacological treatment.

2. METHODS

This systematic review with meta-analysis was conducted in accordance with the PRISMA guidelines [22] and its protocol was previously registered in PROSPERO (CRD42024585814).

2.1 Inclusion Criteria

Randomized and non-randomized clinical trials investigating psychoeducation-based interventions for family members or caregivers of individuals diagnosed with first-episode psychosis or early psychosis were included. Study selection followed these criteria:

a) **Study design:** Both randomized and non-randomized clinical trials were eligible if they provided quantitative data allowing group comparisons.

b) **Population:** Individuals with a confirmed diagnosis of first-episode psychosis or early psychosis established through internationally recognized diagnostic instruments or specialized clinical assessment. Early psychosis was operationally defined as a duration of up to five years since the onset of psychotic symptoms. All included studies comprised samples in which at

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least 50% of participants were individuals experiencing a first episode of psychosis. No restrictions were applied regarding the age of patients or their family members/caregivers.

c) **Intervention:** Interventions consisted of psychoeducation programs directed at family members or caregivers, regardless of delivery format (in-person or online) or number of sessions. Any type of psychoeducation was considered eligible, with no requirement for structured manuals, as no universally established model exists for this population.

d) **Control group:** Studies comparing the intervention with treatment as usual or with other non-pharmacological interventions were included.

e) **Outcomes:** Outcomes included general psychopathology, positive and negative symptoms, global patient functioning, number and duration of hospitalizations, and caregiver-related outcomes, particularly caregiver burden. Only studies reporting clinically relevant outcomes measured by standardized and comparable scales were considered.

f) **Language:** No restrictions were applied to publication language, provided the full text was available and understandable to the research team.

2.2 Exclusion Criteria

Studies were excluded if psychoeducation was not the primary intervention, or if they were meta-analyses, reviews, editorials, cross-sectional studies, case reports, studies without a control group or with non-comparable outcomes, as well as study protocols and conference abstracts or posters.

2.3 Information Sources and Search Strategy

A comprehensive search was performed in PubMed, Embase, Scopus, and Cochrane Library up to April 2024, using a strategy designed to identify studies evaluating interventions targeting family members or caregivers following a first psychotic episode. The electronic searches were subsequently updated in June 2025 to capture newly published studies. The search combined terms related to the clinical condition and the intervention of interest. The descriptors included ((early psychosis) OR (first episode psychosis)) combined with ((psychoeducat*) OR (educat*) OR (Patient Education as Topic [majr])) to capture a broad range of articles, including those addressing educational

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interventions not using the term “psychoeducation” consistently. No filters or outcome restrictions were applied at the search stage to maximize sensitivity, with outcomes defined during full-text screening. Additionally, a manual search of reference lists of selected articles was conducted to identify further relevant publications.

2.4 Study Selection

Screening was performed using Rayyan software. In the first stage, three reviewers independently screened titles and abstracts. One author (TB) fully reviewed all records, while two co-authors (LT and VA) shared the initial screening. Discrepancies were resolved by an independent reviewer (CG). In the second stage, full texts were assessed for eligibility based on the predefined criteria (TB).

2.5 Data Extraction

Data extraction was performed using a standardized procedure. One researcher (TB) conducted the initial extraction, which was independently reviewed by a second researcher (DB). Each study was analyzed for the presence of outcomes of interest. When an article reported more than one relevant outcome with compatible data, it was included in multiple analyses. Only studies providing quantitative data suitable for meta-analysis were included in the final synthesis. For symptom-related outcomes, data at the end of the intervention and, when available, at two years post-intervention were extracted. Additional extracted information included first author, year of publication, country of origin, study design, total sample size, participant demographics, study setting (inpatient or outpatient), diagnostic criteria, characteristics of the intervention and control group, evaluated outcomes, standardized scales used, and follow-up duration (Table 1).

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Table 1: *Characteristics of the included studies*

Author, Year	Country	Total Sample (treatment vs control)	Patient data	Carer data	Patient Diagnosis (criteria)	Control	Intervention	Measures	Duration of study and endpoints
Calvo et al, 2015	Spain	55 participants 27 FPE 28 NS	Age between 14 and 18 years. Intervention: mean age 16.4 (+1.34); 59.3% male; 92.6% white Control: mean age 16.5 (+1.45); 64.3% male; 85.7% white	NR	Psychotic disorder according to DSM-IV-TR + K-SADS-PL	Unstructured group intervention	Group intervention for adolescents with psychosis and their families 3 initial individual sessions of 50 minutes 12 group sessions of 90 minutes every 15 days	1. Psychotic symptoms 2. Functioning 3. Number of hospitalizations 4. Total days hospitalized 5. Number of emergency visits	Participants and family members were assessed at baseline, after the intervention, and 2 years after the intervention
Chien et al, 2020	Hong Kong	114 participants 38 PST 38 FPE 38 TAU	Chinese adults between 18 and 60 years Intervention: mean age 26.2 (+7.8); 60.5% male Control: mean age 26.5 (+7.7); 63.2% male	Over 18 years old, being the patient's primary caregiver Intervention: mean age 33.9 (+8.3); 68.4% female Control: mean age 35.8 (+9.0); 68.4% female	Psychotic disorder according to DSM-IV-TR or DSM-5 with onset less than 5 years	TAU	12 group sessions of 90 minutes every two weeks in activity rooms at health centers	1. Caregiver burden 2. Caregiver experience 3. Caregiver problem-solving skills 4. Psychotic symptoms 5. Recovery progress 6. Number of hospitalizations 7. Length of hospitalizations	Participants assessed at baseline, 1 week after, and 6 months after the intervention
Chien et al, 2018	Hong Kong	210 participants 70 TAU 70 FPE 70 FSG	Chinese adults over 18 years old Intervention: mean age 26.2 (+7.3); 57.9% male Control: mean age 28.9 (+6.3); 51.4% male	Chinese adults over 18 years old Intervention: mean age 42.1 (+8.6); 65.7% female Control: mean age 39.6 (+8.9); 67.1% female	Psychotic disorder according to DSM-IV-TR with onset less than 5 years	TAU	16 group sessions of 2 hours with 14-16 members in each group (McFarlane and Lehman Manual)	1. Family functioning 2. Caregiver burden 3. Use of health care systems 4. Patient functioning 5. Psychotic symptoms	Participants assessed at baseline, after intervention and after 12, 24 and 48 months
Marchira et al, 2017	Indonesia	100 participants 50 FPE 50 TAU	Mean age 22.4 (+4.5); 61% male	Mean age 47.2 (+12.17); 65% female	Psychotic disorder according to ICD-10 with less than 1 year of duration	TAU	4 sessions once a week, 1-2 hours each	1. Knowledge about psychosis 2. Adherence 3. Symptoms	Participants assessed at baseline, post-intervention, and 6 months after the intervention
Petersen et al, 2004	Denmark	547 participants 275 FPE 272 TAU	Intervention: age 26.6 (+6.4); 58% male Control: age 26.6 (+6.3); 60% male	NR	Diagnosis according to ICD-10 with less than 12 weeks of antipsychotic use	TAU	Multifamily groups - 90-minute sessions twice a month for 18 months - Associated with social skills groups for the patients	1. Symptoms 2. Substance use 3. Diagnosis of depression 4. Suicidal behavior or ideation 5. Social outcomes 6. Non-adherence to treatment 7. Days in hospital 8. Antipsychotic use	Participants assessed at baseline and after 12 and 24 months
Rossberg et al, 2010	Norway / Denmark	301 participants 147 invited to participate in groups 99 declined participation 54 not invited	Intervention: mean age 23.6 (+6.4); 62% male Control: mean age 34.8 (+10.70); 43% male	NR	Diagnosis according to DSM-IV	TAU	90-minute sessions in multifamily groups monthly	1. Psychotic symptoms 2. Global functioning 3. Remission and relapse 4. Premorbid adjustment 5. Quality of life	Participants assessed at baseline, 3 months, 1 year, 2 years, and 5 years of follow-up
Lobban et al, 2013	United Kingdom	103 participants 51 FPE 51 TAU	Youth and adults between 14 and 35 years old	83% Female 94% White 74% Mothers of the patients	NR	TAU	4 days of training over 3 months; afterwards, monthly meetings throughout the study period	1. Family member's distress 2. Caregiving experience 3. Carer Well-Being and Support 4. Concerns and ability to cope 5. Hope	Assessment at baseline and after 6 months of the intervention
Zhang et al, 2023	Hong Kong	65 participants 33 MBFPE 32 FPE	Patients under 35 years old; 50% male	64.6% were over 51 years old; 78.5% were women	Diagnosis of psychotic disorder according to DSM-5 with onset up to 3 years	Mindfulness	Both programs consisted of 6 sessions with a total of 12 hours	1. Caregiver burden 2. Caregiver experience 3. Caregiver physical distress 4. Caregiver mental health 5. Caregiver well-being 6. Caregiver interpersonal mindfulness 7. Caregiver detachment 8. Patient recovery level 9. Caregiver expressed emotion assessed by the patient	Measures at baseline and after the intervention Measure at 9 months not yet included in this article
Gleeson et al, 2023	Australia	164 participants 82 FPE 82 TAU	Mean age 22 years (SD 2.85) 55.5% male	Intervention: mean age 50.35 (+10.37); 74% female Control: mean age 51.72 (+8.94); 76% female	Diagnosis of psychosis or mood disorder with psychosis according to DSM-IV-TR with less than 6 months of antipsychotic use	TAU	Access to the tool for 12 months; whenever the family member could or wanted, with no time limit	1. Caregiver stress 2. Other secondary measures for stress	Assessment at baseline, 6 and 12 months after intervention
Leavey et al, 2004	United Kingdom	106 participants 57 FPE (24 complete and 33 partial) 49 TAU	Intervention: 54.4% under 25 years; 66.7% male Control: 49.0% under 25 years; 61.2% male	NR	Diagnosis of Psychosis according to ICD-9 with onset less than 6 months	TAU	7 sessions of approximately 1 hour at a location chosen by the caregiver (usually their home)	1. Family satisfaction with the health service 2. Number of days hospitalized 3. Number of hospital admissions 4. Perceived severity of the illness 5. Caregiving burden	Assessment at baseline, 4 months, and 9 months after the intervention
Lenior et al, 2001	Netherlands	64 participants 31 FPE 33 TAU	Mean age 20.9 years (16 to 26 years); 70% male	NR	Diagnosis according to DSM-III-R Schizophrenia, Schizoaffective, Schizophreniform, and other psychotic disorders	TAU	15 months of follow-up with psychoeducation, communication skills, and problem-solving	1. Symptoms 2. Hospitalizations 3. Social Conditions	Assessment at Baseline and 5 years after intervention
Goldstein et al, 1978	United States	104 participants 46 FPE 50 TAU	Mean age 23.36 years (+4.21); 79% White	NR	New Haven Schizophrenia Index with a score greater than 4 points	TAU	Family therapy with 6 crisis-oriented sessions	1. Symptomatology 2. Hospitalizations	Assessment at admission, discharge, 6 weeks, and 6 months
Kane et al, 2016	United States	404 participants 223 FPE 181 TAU	Age between 15 and 40 years Intervention: 78% male; 62% White Control: 66% male; 44% White	NR	Diagnosis of psychotic disorders according to DSM-IV. All had their first psychotic episode at the beginning of treatment	TAU	10 to 12 sessions + 8 to 12 skills training sessions for some family members only	1. Symptomatology 2. Severity 3. Depressive symptoms 4. Quality of life 5. Hospitalizations	Assessments were conducted at baseline, 6 months, 12 months, 18 months, and 24 months.
Zhang et al, 1994	China	78 participants 39 FPE 39 TAU	100% male Intervention: 23.5 years (+7.6) Control: 24.1 years (+8.1)	NR	Diagnosis of Schizophrenia according to the Chinese Medical Association (1985) at first admission	TAU	Group sessions with up to 15 family members They could be held monthly or quarterly depending on the case	1. Symptomatology 2. Functioning 3. Hospitalizations	Assessments were conducted at baseline and every 3 months up to 18 months.
Valencia et al, 2012	Mexico	73 participants 39 FPE 34 TAU	Intervention: 24.5 years (+3.0); 76.9% male Control: 24.1 years (+3.2); 73.5% male	NR	Diagnosis of psychotic disorders according to DSM-IV. First-episode, treatment-naive patients	TAU	10 group sessions of up to 75 minutes with 6 participants per group	1. Symptomatology 2. Functioning 3. Relapses and Hospitalizations	Assessments were conducted at baseline and 1 year after treatment.

Summary of the 15 studies included in the meta-analysis, detailing first author and year of publication, country, study design, sample size, participants' age and sex, diagnostic criteria, recruitment setting (inpatient or outpatient), intervention characteristics (format, number and duration of sessions, patient participation), type of control group (treatment as usual or other non-pharmacological intervention), evaluated outcomes, measurement instruments, and duration of follow-up. FPE = Family Psychoeducation; TAU = Treatment as Usual; NS = Non-structured group; MBFPE = Mindfulness-Based Family

Psychoeducation; PST = Problem-Solving Therapy; FSG = Family Support Group; NR = Not reported in the original article.

2.5.1 Outcomes

Outcomes were measured through clinical records or structured reports and included: (a) hospitalizations (frequency), (b) duration of hospitalizations (days), (c) general psychopathology assessed with PANSS and BPRS scales, (d) positive symptoms assessed with the PANSS positive subscale and SAPS, (e) negative symptoms assessed with the PANSS negative subscale and SANS, (f) global functioning measured by GAS, GAF, and SLOF, and (g) caregiver stress or burden measured by FBIS, GHQ-28, ZBI, and PSS. The primary outcome was psychiatric hospitalization. Secondary outcomes included length of hospitalizations, psychiatric symptomatology, global functioning, and caregiver stress, as reported in the included studies.

2.5.2 Control Groups

Control groups included patients and family members who received: (a) Treatment as usual (TAU): standard psychiatric follow-up and pharmacotherapy without structured psychoeducation; or (b) Alternative non-pharmacological interventions: such as support groups lacking formal educational content, occupational therapy, or unstructured counseling. The decision to pool different types of control groups was based on clinical homogeneity regarding the absence of structured family psychoeducation, which was the focus of comparison. This approach reflects real-world mental health services, where such variations represent typical baseline conditions.

2.6 Risk of Bias and Quality of Evidence

Risk of bias was assessed using the Cochrane Risk of Bias 2.0 (RoB 2.0) tool for clinical trials, evaluating five domains: randomization process, deviations from intended interventions, missing outcome data, outcome measurement, and selection of reported results. Two researchers (VA, LT) performed independent assessments, resolving disagreements with a third reviewer (TB). Risk of bias

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was rated as “low risk,” “some concerns,” or “high risk” (Supplementary Material, Table S1).

The certainty of evidence was evaluated using the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach, which classifies evidence into four levels: high, moderate, low, or very low. Five domains were considered: risk of bias, inconsistency, imprecision, indirectness, and publication bias. Two reviewers (VA, LT) applied GRADE independently, with disagreements resolved by a third reviewer (TB).

2.7 Effect Measures

Meta-analyses were performed whenever two or more studies presented sufficiently homogeneous interventions and outcomes. For continuous outcomes, standardized mean differences (SMD) with 95% confidence intervals (CI) were calculated using a random-effects model to account for expected heterogeneity. For the outcome of number of hospitalizations, the number of events and sample sizes per group were used to calculate risk ratios (RR) with 95% CI.

2.8 Data Synthesis and Statistical Analysis

We performed pairwise meta-analyses to evaluate the effects of family psychoeducation compared with treatment as usual (TAU) or other non-pharmacological interventions on symptomatic outcomes. Ten independent meta-analyses were conducted, one for each predefined endpoint: eight based on continuous variables (General Symptoms, Positive Symptoms, Positive Symptoms After 2 Years, Negative Symptoms, Negative Symptoms After 2 Years, Functional Status, Functional Status After 2 Years, and Caregiver Burden) and two based on categorical variables (Hospitalizations and Length of Hospitalizations). Analyses were conducted in R (version 4.2.2) using the meta package. Effect estimates were derived with the inverse-variance method under a random-effects model, expressed as SMD for continuous outcomes and RR for categorical outcomes, each with corresponding 95% CI. Between-study heterogeneity was quantified using Cochran’s Q, the I^2 statistic, and τ^2, considering $p < 0.10$ for Q and $I^2 > 25\%$ as indicating potential heterogeneity [23]. Clinical comparability of studies was assessed qualitatively based on

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participant and intervention characteristics. Risk of publication bias was not assessed because no direct comparison included ≥10 trials [24]. All meta-analytic results are presented in forest plots.

3. RESULTS

3.1 Study Selection

A total of 6,729 articles were identified across the databases. After removing duplicates, 4,699 records were screened by title and abstract. Of these, 103 full-text articles were assessed for eligibility, and 12 met all inclusion criteria. In addition to the systematic search, three further studies were included through reference list screening, resulting in a total of 15 included articles. Figure 1 presents the PRISMA flowchart of the selection process.

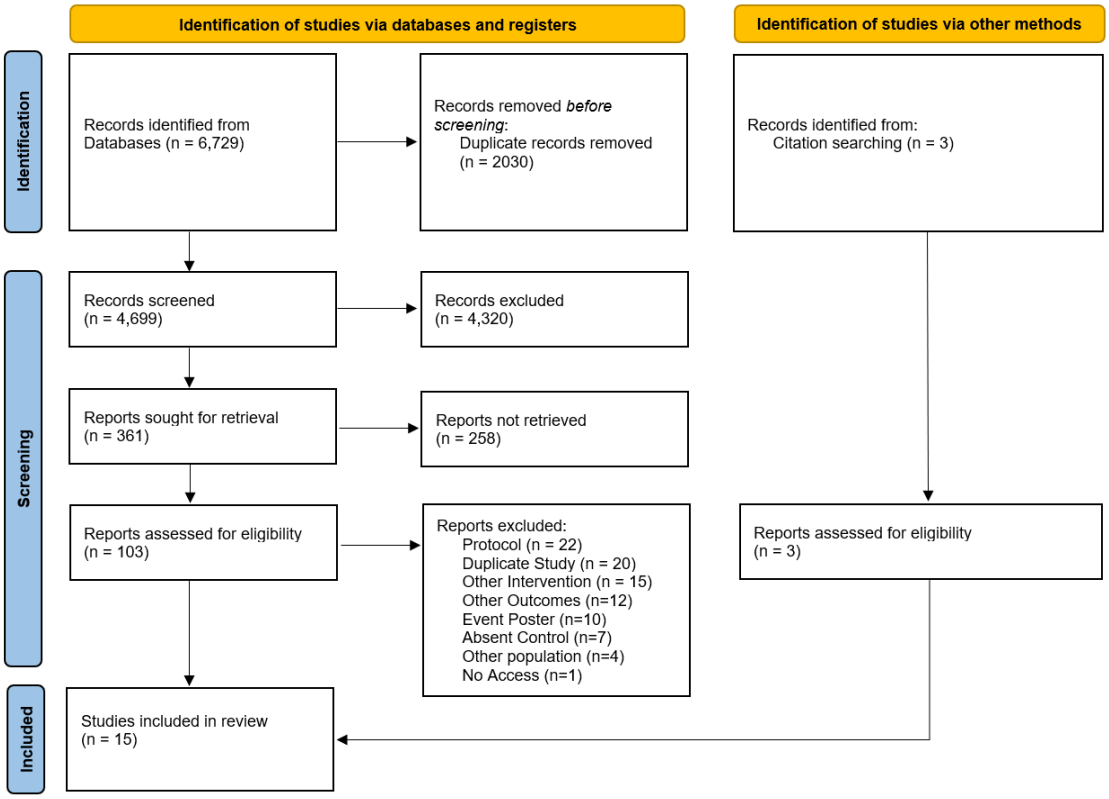


Figure 1: *PRISMA flow diagram of study selection*

Flowchart describing the process of identification, screening, eligibility assessment, and inclusion of studies in the systematic review and meta-analysis. From a total of 6,729 records retrieved (4,699 after duplicates

removal), 103 full-text articles were assessed for eligibility and 15 studies met the inclusion criteria.

The geographical distribution of the included studies was as follows: six in Europe, five in Asia, three in North America, and one in Oceania. All selected studies were published in English.

The DSM-IV-TR was the most frequently used diagnostic instrument for psychotic disorders (k = 4) [25,26,27,28]. Only one study did not specify the diagnostic method [29]. In nine studies [25,26,27,28,29,30,31,32,33], participants were recruited directly from outpatient services, whereas in six studies [34,35,36,37,38,39], recruitment occurred during psychiatric hospitalization. Despite this variation, all interventions were delivered exclusively in outpatient settings.

In seven studies, psychoeducation was provided exclusively to family members [26,27,28,29,33,37,39] while eight studies included sessions in which patients could participate alongside their relatives [25,30,31,32,34,35,36,38]. The number of sessions ranged from 4 to 36 [30,34]. With the exception of one online intervention study, which provided one-year access [28], interventions were delivered within fixed timeframes.

Outcomes were grouped according to symptomatic domains and the measurement scales used in each study. They were categorized as patient-related (general psychopathology, positive symptoms, negative symptoms, number and duration of hospitalizations) or caregiver-related (caregiver burden).

3.2 Study Quality

Quality assessment followed the five domains of the Cochrane Risk of Bias 2.0 (RoB 2.0) tool, evaluating randomization, deviations from intended interventions, missing outcome data, outcome measurement, and selection of reported results. Most studies were judged to have low risk of bias across all domains [25,26,27,28,29,31,32,38,39]. Some were rated as having “some concerns” [30,33,34,36,37] and only one study was classified as high risk of bias, which was also the only study with a non-randomized design[35](Supplementary Material, Table S1). This study was included in the analyses of positive and negative symptoms in order to increase the number of participants and the statistical power, given the limited number of studies available for these outcomes.

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Although this study alone did not demonstrate statistically significant differences between groups, its inclusion contributed to the pooled analyses.

A detailed synthesis of the certainty-of-evidence assessment using the GRADE approach is provided (Supplementary Material, Table S2), describing each analyzed outcome, the number of included studies, effect size (expressed as standardized mean difference or risk ratio), and the corresponding evidence quality classification and clinical relevance.

3.3 Participants

The total sample comprised 2,271 individuals diagnosed with first-episode psychosis or early psychosis, allocated to intervention (n = 1,207) and control (n = 1,064) groups. The overall mean age (n = 1,860) was 24.79 years (±6.67). Detailed age data were available for eight studies (n = 1,574): the intervention group had a mean age of 24.59 years (±6.46), significantly lower than the control group's 25.90 years (±7.39) ($p < 0.01$). Sex distribution was reported in 13 studies, with 59.23% male participants overall; the proportions were 60.89% in the intervention group and 57.33% in the control group, with no statistically significant difference ($p = 0.09$).

3.4 Hospitalizations

The pooled analysis demonstrated a significant reduction in psychiatric hospitalizations among patients whose relatives received psychoeducation. Using a random-effects model, the overall risk ratio (RR) was 0.64 ($k = 9$; 95% CI 0.45–0.90; $p = 0.01$; $I^2 = 41.5\%$), corresponding to an approximately 36% reduction in hospitalization risk compared with controls (Figure 2).

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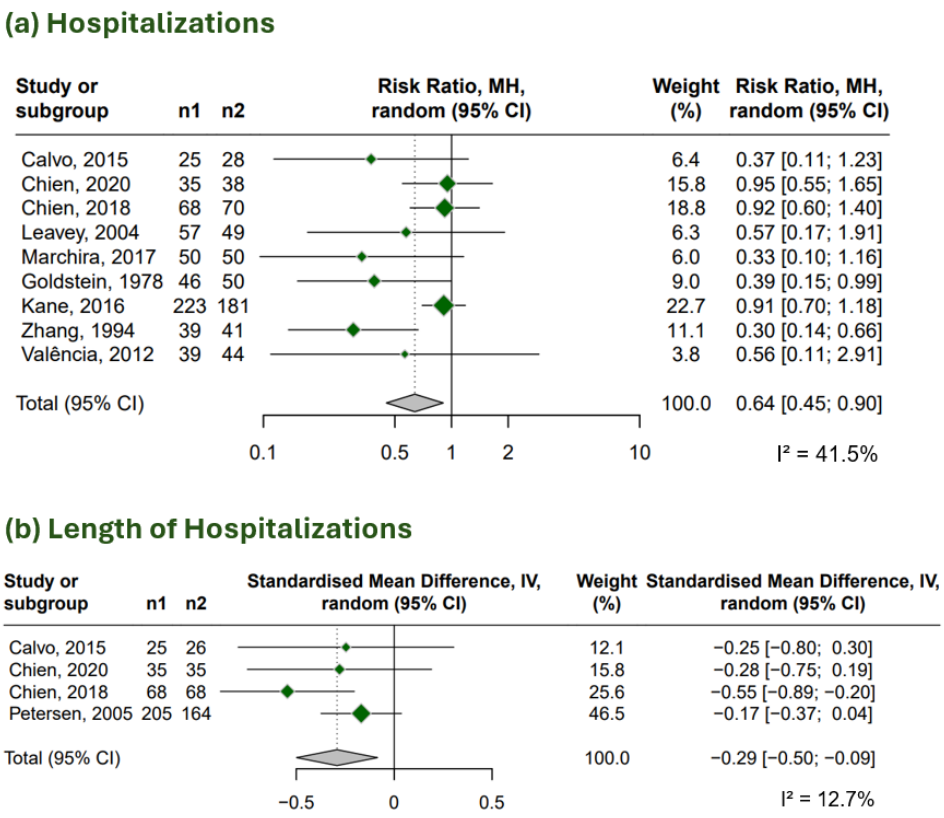


Figure 2: *Forest plots for psychiatric hospitalizations and duration of hospital stay* Random-effects meta-analysis of family psychoeducation versus treatment as usual or other non-pharmacological interventions. Panel A shows risk ratios (RR) with 95% confidence intervals (CI) for the number of psychiatric hospitalizations (RR = 0.64; 95% CI 0.45–0.90; I^2 = 41.5%), indicating an approximately 36% risk reduction. Panel B shows standardized mean differences (SMD) for total length of psychiatric hospitalization (SMD = –0.29; 95% CI –0.50 to –0.09; I^2 = 12.7%).

Regarding duration of psychiatric hospitalization, aggregated meta-analytic data also showed a statistically significant difference. Patients in the intervention group spent an average of 47.47 days (±80.82) hospitalized compared to 58.36 days (±89.08) in the control group. The total standardized mean difference (SMD) was –0.29 (k = 4; 95% CI –0.50 to –0.09; $p < 0.01$; I^2 = 12.7%), indicating a significant effect (Figure 2).

3.5 Symptoms

Meta-analytic results indicated a statistically significant advantage of the intervention over control for general psychopathology, positive symptoms, and

negative symptoms (Figure 3). The effect on negative symptoms persisted after two years of follow-up, while the effect on positive symptoms was no longer significant (Figure 3).

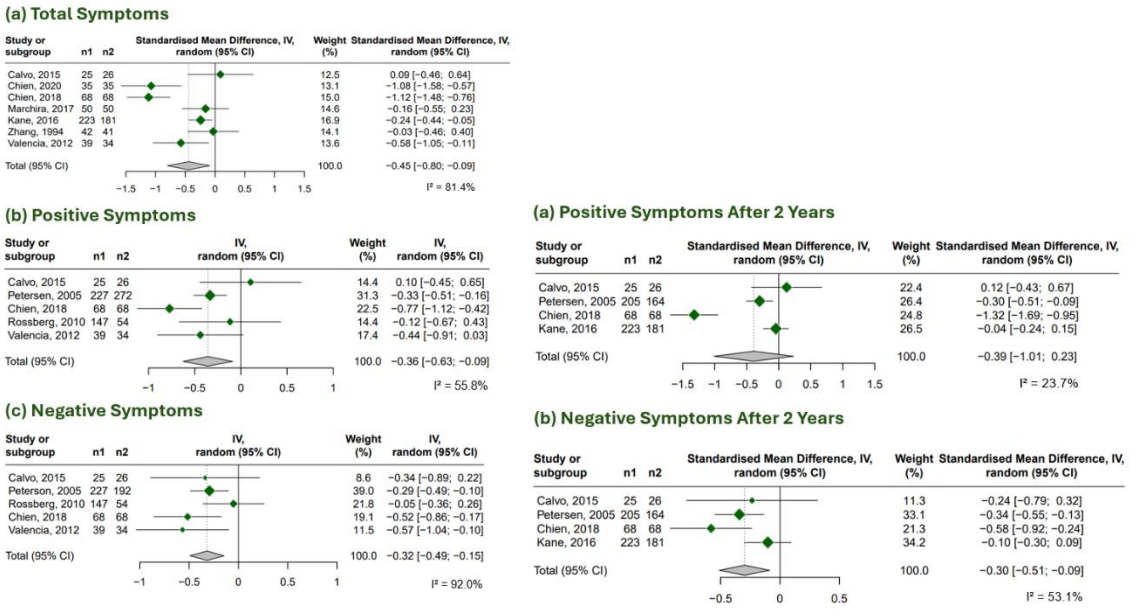


Figure 3: *Effects of family psychoeducation on general psychopathology, positive symptoms, and negative symptoms at the end of intervention and long-term effects (2-year follow-up) on positive and negative symptoms*

Forest plots displaying pooled SMD (95% CI) comparing intervention and control groups for general psychopathology (SMD = –0.45; 95% CI –0.80 to –0.09; I^2 = 81.4%), positive symptoms (SMD = –0.36; 95% CI –0.63 to –0.09; I^2 = 55.8%), and negative symptoms (SMD = –0.32; 95% CI –0.49 to –0.15; I^2 = 23.7%). The effect on negative symptoms remained significant (SMD = –0.30; 95% CI –0.51 to –0.09; I^2 = 53.1%), while the effect on positive symptoms was no longer significant (SMD = –0.39; 95% CI –1.01 to 0.23; I^2 = 92.0%) after 2-year follow-up.

For general psychopathology, the pooled SMD was –0.45 (k = 7; 95% CI –0.80 to –0.09; p = 0.01; I^2 = 81.4%), reflecting a small-to-moderate and statistically significant effect, albeit with high heterogeneity(Figure 3).

For positive symptoms, the pooled SMD was –0.36 (k = 5; 95% CI –0.63 to –0.09; p < 0.01;I^2 = 55.8%), indicating a small but significant effect. At two-

year follow-up, the effect was SMD = –0.39 (k = 4; 95% CI –1.01 to 0.23; p = 0.21; I^2 = 92.0%), which was not statistically significant (Figure 3).

For negative symptoms, the pooled SMD was –0.32 (k = 5; 95% CI –0.49 to –0.15; p < 0.01; I^2 = 23.7%), representing a small but significant effect. This benefit was sustained at two years, with SMD = –0.30 (k = 4; 95% CI –0.51 to –0.09; p < 0.01; I^2 = 53.1%) (Figure 3).

A sensitivity analysis was conducted excluding the only non-randomized study included in the review [35], which had been previously identified as having a very high risk of bias. The pooled effect sizes remained similar after its exclusion. For positive symptoms, the pooled effect size changed to −0.39 (k = 4; 95% CI −0.70 to −0.09; I^2 = 63.3%). For negative symptoms, the pooled effect size changed to −0.37 (k = 4; 95% CI −0.53 to −0.22; I^2 = 0.0%).

No statistically significant differences were observed between intervention and control groups in patient functional outcomes or caregiver stress (Supplementary Materia, Figure S1 and Figure S2). For functional status, SMD was 0.49 (k = 5; 95% CI –0.15 to 1.13; p = 0.13; I^2 = 89.4%) at the end of intervention and 0.32 (k = 3; 95% CI –0.19 to 0.83; p = 0.21; I^2 = 81.5%) at two-year follow-up. For caregiver stress, SMD was –0.16 (k = 5; 95% CI –0.34 to 0.01; p = 0.07; I^2 = 0.0%). The pooled analysis thus indicated small, non-significant effects in both cases, suggesting that family psychoeducation did not exert a consistent impact on these outcomes in the included samples.

4. DISCUSSION

This systematic review and meta-analysis demonstrated that psychoeducational interventions directed to relatives of patients with first-episode psychosis or early psychosis are associated with clinically meaningful benefits. The main findings include a significant reduction in the number of hospitalizations, as well as improvements in general psychopathology, positive symptoms, and negative symptoms. Among the outcomes analyzed, only patient functioning and caregiver stress did not show statistically significant between-group differences.

The effect on hospitalizations is particularly relevant, as the approximately 36% reduction in admission risk indicates a direct impact on clinical course and on health-care resource utilization. Similar results have been reported in

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patients with more advanced stages of schizophrenia [40], suggesting that psychoeducation plays a preventive role by promoting treatment adherence and the early identification of relapse signs. Given that psychiatric readmissions are associated with poorer prognosis and greater illness severity [41,42], the evidence presented here reinforces psychoeducation as a strategic tool for early intervention.

Regarding symptomatology, the intervention yielded positive effects on both positive and negative symptoms. Improvement in positive symptoms may relate to better medication adherence and earlier relapse detection, whereas effects on negative symptoms likely reflect reduced social isolation and the strengthening of more structured family relationships. These findings suggest that structured family involvement can modulate the clinical trajectory, operating not merely as support but as an active therapeutic component [43,44]. However, effects do not persist indefinitely: while gains in negative symptoms remain for up to two years, the effect on positive symptoms loses statistical significance over that interval. This pattern underscores the need for ongoing or maintenance programs capable of periodically reinforcing learned content and strategies, in line with established principles of psychosocial interventions [45,46,47]. This attenuation of long-term effects on positive symptoms may also reflect a floor effect, as symptom levels tend to be low and similar across groups over time, whereas the greater persistence of negative symptoms allows for more sustained differentiation between interventions.

By contrast, no significant differences were found for global patient functioning or caregiver stress. Given their multifactorial complexity, these outcomes may require more intensive, longer-duration interventions or combinations with other therapeutic modalities for robust effects to emerge [48]. Divergent findings were reported in a recent meta-analysis [49], which described benefits for caregiver stress in family interventions for first-episode psychosis. However, this effect did not persist when analyses were restricted to psychoeducation alone, suggesting that caregiver stress may depend on broader family-based approaches.

From clinical and economic perspectives, family psychoeducation is a low-cost intervention, feasible to implement in outpatient and community services, and highly cost-effective [50,51]. By reducing hospitalizations, it not only yields

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substantial savings for health systems but also fosters greater clinical stability and better quality of life for patients. Such features make psychoeducation particularly relevant in low- and middle-income countries, where resource optimization is a priority.

This review has several limitations, including methodological heterogeneity among the included studies, small sample sizes in some trials, and limited follow-up durations. These factors may have influenced the consistency of the results, particularly for secondary outcomes. In addition, potential moderating variables could not be formally explored due to the limited number of studies available for each comparison. A sensitivity analysis excluding the only non-randomized study [35] was conducted and yielded similar results, indicating that the overall findings were not driven by this study. However, other subgroup analyses, such as differences in intervention format (e.g., psychoeducation delivered exclusively to family members versus interventions involving both patients and relatives), could not be performed because the small number of studies would have resulted in limited statistical power and restricted interpretability.

Future research should therefore prioritize greater methodological standardization, including the use of randomized designs, clearer diagnostic criteria for first-episode psychosis, consistent reporting of the duration and structure of psychoeducational interventions, and explicit definition of whether interventions target family members alone or include patient participation. Larger samples and longer follow-up periods are also needed to assess the durability of effects and to elucidate the specific mechanisms through which psychoeducation influences the clinical course. Although the cut-off of up to five years since illness onset allows the inclusion of some patients beyond a strict definition of first-episode psychosis, this criterion is widely used in the early psychosis literature and reflects the clinical practice of early intervention services. Nevertheless, some heterogeneity regarding the stage of illness across the included studies cannot be excluded. The inclusion of a non-randomized study in some analyses reflects the limited number of available studies and has introduced greater heterogeneity and reduced methodological robustness. Nevertheless, this decision allowed for an increased sample size and provided more informative pooled effect estimates

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In summary, the results of this meta-analysis indicate that family psychoeducation is an effective, low-cost intervention with potential for integration into policies of continuous mental-health care. When implemented in a structured manner, it can reduce readmissions, optimize resources, and contribute to a more favorable prognosis for patients in the early stages of psychosis.

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Supplementary Material

Supplementary Table S1 *Risk of bias assessment of included studies (RoB 2.0)*

Unique ID	Study ID	D1	D2	D3	D4	D5	Overall
1	Calvo, 2015	+	+	+	+	+	+
2	Chien, 2020	+	+	+	+	+	+
3	Chien, 2018	+	+	+	+	+	+
4	Marchira, 2017	+	!	+	+	+	!
5	Petersen, 2004	+	+	+	!	+	!
6	Rossberg, 2010	-	-	-	-	!	-
7	Lobban, 2013	+	+	+	+	+	+
8	Zhang, 2023	+	+	+	+	+	+
9	Gleeson, 2023	+	+	+	+	+	+
10	Leavey, 2004	+	+	+	+	+	+
11	Lenior, 2001	!	+	+	+	!	!
12	Goldstein, 1978	+	!	+	+	+	!
13	Kane, 2016	!	+	+	+	+	!
14	Zhang, 1994	+	+	+	+	+	+
15	Valencia, 2012	+	+	+	+	+	+

+ Low risk
! Some concerns
- High risk

D1 Randomization process
D2 Deviations from the intended interventions
D3 Missing outcome data
D4 Measurement of the outcome
D5 Selection of the reported result

Cochrane Risk of Bias 2.0 evaluation of each included study across five domains: (1) randomization process, (2) deviations from intended interventions, (3) missing outcome data, (4) measurement of the outcome, and (5) selection of the reported results. Ratings are presented as low risk, some concerns, or high risk of bias.

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Supplementary Table S2 *GRADE certainty-of-evidence assessment for main outcomes*

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Family Psychoeducation	TAU	Relative (95% CI)	Absolute (95% CI)		
General Symptoms (assessed with: PANSS or BPRS)												
7	randomised trials	not serious	serious[a]	not serious	not serious	none	482	435	-	SMD **0.45 SD fewer** (0.8 fewer to 0.09 fewer)	⨁⨁⨁◯ Moderate[e]	CRITICAL
Positive Symptoms (assessed with: PANSS or SAPS)												
5	randomised trials	not serious	serious[b]	not serious	not serious	none	506	454	-	SMD **0.36 SD fewer** (0.63 fewer to 0.09 fewer)	⨁⨁⨁◯ Moderate[b]	CRITICAL
Positive Symptoms (After 2 Years) (assessed with: PANSS or SAPS)												
4	randomised trials	not serious	very serious[c]	not serious	serious[d]	none	521	439	-	SMD **0.39 SD fewer** (1.01 fewer to 0.23 more)	⨁◯◯◯ Very low[c,d]	CRITICAL
Negative Symptoms (assessed with: PANSS or SANS)												
5	randomised trials	serious[e]	not serious	not serious	not serious	none	506	374	-	SMD **0.32 SD fewer** (0.49 fewer to 0.15 fewer)	⨁⨁⨁◯ Moderate[e]	CRITICAL
Negative Symptoms (After 2 Years) (assessed with: PANSS or SANS)												
4	randomised trials	serious[f]	serious[g]	not serious	not serious	none	512	439	-	SMD **0.3 SD fewer** (0.51 fewer to 0.09 fewer)	⨁⨁◯◯ Low[f,g]	CRITICAL
Caregiver Burden (assessed with: FBIS, GHQ-28, ZBI, PSS)												
5	randomised trials	not serious	not serious	not serious	serious[d]	none	246	256	-	SMD **0.16 SD fewer** (0.34 fewer to 0.01 more)	⨁⨁⨁◯ Moderate[d]	IMPORTANT
Functional Status (assessed with: GAF, C-GAS, GAS, SLOF)												
5	randomised trials	not serious	serious[h]	not serious	serious[d]	none	401	361	-	SMD **0.49 SD more** (0.15 fewer to 1.13 more)	⨁⨁◯◯ Low[d,h]	IMPORTANT
Functional Status (After 2 Years) (assessed with: GAF, C-GAS, SLOF)												
3	randomised trials	not serious	serious[i]	not serious	serious[d]	none	298	258	-	SMD **0.32 SD more** (0.19 fewer to 0.83 more)	⨁⨁◯◯ Low[d,i]	IMPORTANT
Hospitalizations												
9	randomised trials	not serious	not serious	not serious	not serious	none	582/1133 (51.4%)	551/1133 (48.6%)	**RR 0.64** (0.45 to 0.90)	**175 fewer per 1.000** (from 267 fewer to 49 fewer)	⨁⨁⨁⨁ High	CRITICAL
Length of Hospitalizations (assessed with: Days)												
6	randomised trials	serious[j]	not serious	not serious	not serious	none	333	293	-	SMD **0.29 SD fewer** (0.5 fewer to 0.09 fewer)	⨁⨁⨁◯ Moderate[j]	CRITICAL

CI: confidence interval; **RR:** risk ratio; **SMD:** standardised mean difference

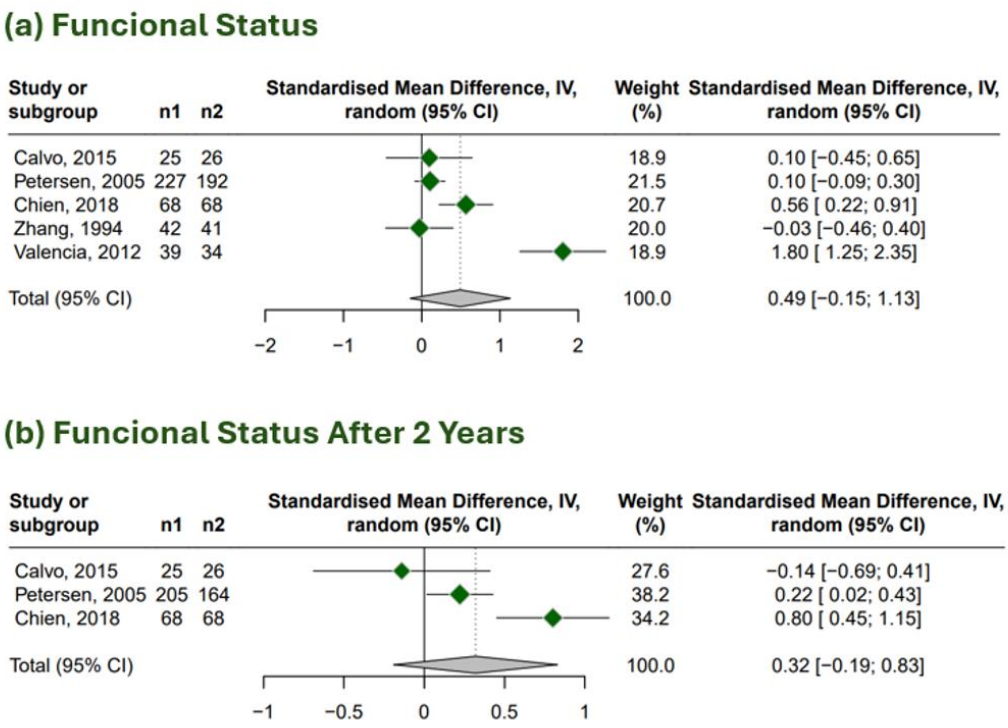
Explanations

a. Downgraded for inconsistency due to substantial heterogeneity (I^2 = 81.4%).
b. Downgraded for inconsistency due to moderate heterogeneity (I^2 = 55.8%).
c. Downgraded for inconsistency due to very high heterogeneity (I^2 = 92%).
d. Downgraded for imprecision because the confidence interval crosses the null effect
e. Downgraded for risk of bias because one study had high risk of bias and contributed substantially to the pooled estimate.
f. Downgraded for risk of bias because most studies presented some concerns regarding methodological quality.
g. Downgraded for inconsistency due to heterogeneity (I^2 = 53.1%).
h. Downgraded for inconsistency due to very high heterogeneity (I^2 = 92%)
i. Downgraded for inconsistency due to substantial heterogeneity (I^2 = 87.2%).
j. Downgraded for risk of bias because one study with moderate risk contributed nearly half of the total sample.

Summary of the certainty-of-evidence evaluation for each primary and secondary outcome—psychiatric hospitalizations, length of hospital stay, general psychopathology, positive and negative symptoms (including 2-year follow-up), functional outcomes, and caregiver burden—showing number of studies, pooled effect size (risk ratio or standardized mean difference), 95% confidence interval, GRADE rating (high, moderate, low, or very low), and notes on clinical relevance.

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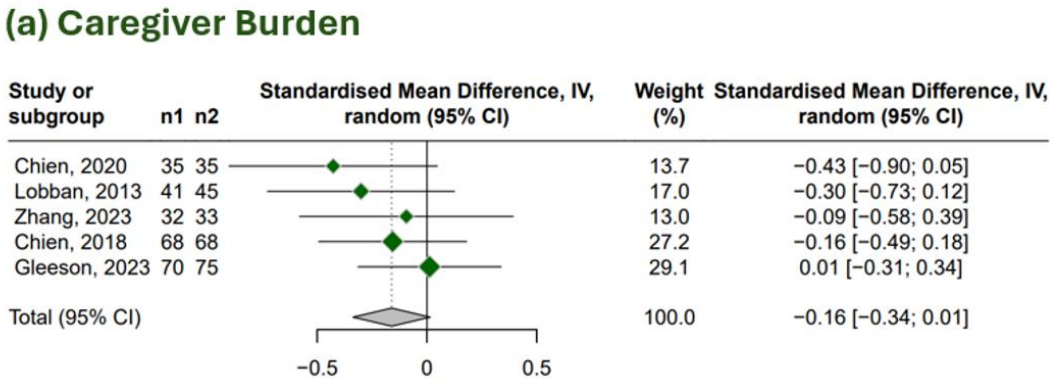
Supplementary Figure S1 *Effect of family psychoeducation on patient functional outcomes*



Meta-analysis of SMD (95% CI) comparing intervention and control groups for global functioning at the end of the intervention (SMD = 0.49; 95% CI –0.15 to 1.13) and at two-year follow-up (SMD = 0.32; 95% CI –0.19 to 0.83), showing no statistically significant effects.

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Supplementary Figure S2 *Effect of family psychoeducation on caregiver burden or stress*



Forest plot presenting pooled SMD (95% CI) for caregiver stress/burden (SMD = –0.16; 95% CI –0.34 to 0.01), indicating no significant difference between intervention and control groups.

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