

Availability and effectiveness of multicomponent interventions for early psychosis in 20 low-income and middle-income countries: a systematic review

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Summary

Background Most individuals with psychosis live in low- and middle-income countries (LMICs) where treatment delays and gaps are common. Little is known about the types of interventions for first-episode psychosis (FEP) and clinical high-risk (CHR) for psychosis in LMICs and their effectiveness. This systematic review aimed to identify treatment components delivered for FEP or CHR in LMICs and evaluate their effectiveness.

Methods In this systematic review, we searched PsycINFO, Embase, and Medline for relevant studies published, without any language restrictions, between database inception and Jan 23, 2022. This search was updated on May 15, 2024 and on January 2, 2026. Records were included if they evaluated at least one more intervention beyond medication and assessment for FEP and beyond assessment for CHR, in LMICs with at least one follow-up. Included papers were classified as programmes (offering FEP/CHR services) or research studies of intervention(s)/outcomes in FEP/CHR. Treatment components were categorised as guideline-based or additional. Effectiveness was assessed across 15 outcomes defined *a priori*. Study quality was evaluated using the Mixed Methods Appraisal Tool, and findings were synthesised narratively. This study was pre-registered with PROSPERO, CRD42022308467.

Findings Of 6046 screened records, 125 were included (average: 152 participants; range: 10–1268) across 20 countries and five languages (English, Spanish, Portuguese, Turkish, and Persian). These comprised 10 programmes and 30 studies for FEP in 16 countries (11.7% of LMICs), and eight programmes and eight studies for CHR across eight countries (5.8%). They delivered guideline-based and additional components; however, psychological and psychosocial components were scarce. For FEP, the addition of any psychological or psychosocial component was associated with improved outcomes relative to medication alone. Patient psychoeducation and family interventions were the most frequently implemented components. For CHR, limited data prevented conclusions about the effectiveness of treatment components in LMICs.

Interpretation Despite limited and moderate-quality evidence, our findings suggest that early intervention can improve outcomes in FEP. However, coverage remains limited to few LMICs and even they struggle to provide comprehensive care. Further research is needed to strengthen, scale, and culturally adapt such services.

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Introduction

Early intervention in psychosis (EIP) integrates pharmacological, psychosocial and psychological strategies to detect and treat people with first-episode psychosis

(FEP) or at clinical high-risk (CHR).¹ Grounded in optimism and the principle that early, comprehensive care is better than traditional, often delayed, and medication-focused treatment,² EIP has demonstrated superior

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Research in context

Evidence before this study

We searched Medline from database inception until January 1, 2022, using terms related to “systematic review”, “network meta-analysis”, “meta-analysis”, “first-episode psychosis”, “clinical high-risk for psychosis”, and “early intervention in psychosis”, without language restrictions. This search was repeated in April 30, 2024. We found two systematic reviews with meta-analyses that reported that early intervention for psychosis (EIP) programmes in high-income countries (HICs) are clinically effective. We also identified two systematic reviews reporting the cost-effectiveness of EIP in HICs. Only one systematic review examined EIP in the Global South (N = 18 studies). It was restricted to low- and lower-middle-income countries and included only English-language records, which limited its comprehensiveness. To date, there has been no review of the full range of treatment components offered for first-episode psychosis (FEP) and clinical high-risk for psychosis (CHR), across low- and middle-income countries (LMIC), regardless of publication language. This gap is critical given that most individuals with psychosis live in LMICs, which face systemic barriers to mental healthcare delivery, including workforce shortages, limited financial resources, and inadequate infrastructure.

Added value of this study

To the best of our knowledge, this is the most comprehensive and inclusive systematic review of multicomponent interventions for FEP and CHR in LMICs (n = 125 studies) to date. By screening and identifying records across multiple languages and distinguishing structured EIP programmes from one-off studies, we generated accurate counts for the field: 10 EIP programmes and 30 studies for FEP across 16 LMICs, and only eight

programmes and eight studies for CHR across eight LMICs. Using validated fidelity and guideline frameworks, we classified treatment components; documented delivery settings and cultural adaptations; and assessed the effectiveness of both integrated (≥ 2 components besides medication) and single-component (besides medication) interventions. Our review establishes, albeit with moderate-quality evidence, that integrated and single-component interventions showed benefits across several outcomes in FEP, though results were mixed for some. Guideline-based psychological and psychosocial components remain inconsistently available across FEP and CHR programmes and studies in LMICs. We also establish the scarcity of data on the effectiveness of interventions for CHR in LMICs, and identify challenges relating to implementation infrastructure, inclusion criteria, and service accessibility.

Implications of all the available evidence

Public funding for EIP services in HICs began growing with the emergence of the sort of evidence that we have now established the existence of in LMICs. Our review strengthens the impetus for the wider adoption and larger-scale study of EIP in LMICs, where it has the potential to improve the lives of the largest numbers of people with FEP. Our work helps build the case for governments in LMICs to confidently commit resources to expanding multicomponent EIP services for FEP based on the evidence for their effectiveness. But as they do so, governments and other global bodies must also invest in research and novel implementation strategies to address the gaps that we identified, including in the provision of psychological and psychosocial components, larger-scale implementation and evidence on population-level outcomes.

clinical, functional, and quality-of-life benefits over standard care in randomised trials and meta-analyses,³ with proven cost-effectiveness.⁴ For CHR, although limited compared to that for FEP, evidence has shown that EIP can delay, prevent, or ameliorate transition to psychosis.⁵

The provision of multiple components is emphasised in EIP given the range of needs of people with psychosis and that different components target different outcomes.⁶ EIP typically combines low-dose antipsychotic medication, consistent follow-up often through case management, psychoeducation, family interventions, cognitive-behavioural therapy (CBT) and measures to reduce treatment delays and streamline care pathways.¹ Some programmes incorporate peer support, digital tools, and population-level initiatives like public education and early detection campaigns.^{1,6}

EIP programmes originated in high-income countries (HICs), where evidence for their benefits, their integration into publicly funded healthcare systems, and support from health authorities drove their national

or regional implementation as the standard of care for FEP.⁷ In many HICs, standards, fidelity scales, and clinical guidelines now support the quality and consistency of EIP.^{8,9}

In low- and middle-income countries (LMICs), EIP remains nascent. EIP services—often limited to urban research centres—have usually been pioneered by individual clinicians or institutions rather than driven by policy.¹⁰ Structural barriers, including workforce shortages, underfunding, and scarce facilities, impede mental healthcare service delivery and reform.¹¹ Care for schizophrenia and other psychotic disorders often consists primarily of antipsychotic medication with minimal psychosocial support.¹² Systematic quality measures (e.g., guidelines) and large-scale rollouts are rare.¹³

Little is known about the extent to which LMIC programmes provide the multicomponent care recommended for early stages of psychosis, or whether components are adapted to local contexts. The one existing

systematic review of EIP services in the Global South (n = 18 studies from 6 countries) was based on articles written in English and from only low- and lower-middle-income countries.¹⁴ It remains necessary to examine the broader group of LMICs—low-, lower-middle- and upper-middle-income settings—and to include studies published in multiple languages that assess any interventions comprising more than one treatment component, rather than focussing solely on self-labelled “EIP” programmes. The beforementioned review only identified one CHR initiative in Tunisia,¹⁵ when scientific evidence points to CHR initiatives in other LMICs.^{16,17} Expanding the evidence base in this way can help identify effective strategies to strengthen early psychosis care across diverse LMIC settings.

This review addresses these gaps by examining: (1) the availability and composition of multicomponent interventions for FEP and CHR in LMICs, and (2) their effectiveness. As in other systematic reviews, the absence of studies from particular LMICs reflects not only the absence of early intervention initiatives but also unpublished data or publications with *no* description of treatment components or follow-up data.

Methods

This systematic review followed PRISMA guidelines and was prospectively registered in PROSPERO (CRD42022308467). As this systematic review was conducted using data from previously published studies, further ethical approval and written informed consent were not required.

Eligibility criteria

Records were included if: (1) participants were experiencing a FEP or were at CHR; (2) participants came from an LMIC(s)¹⁸; (3) at least one additional EIP component was delivered, beyond clinical assessment and antipsychotic medication for FEP, or beyond clinical assessment for CHR (this defined multicomponent intervention for the two groups); (4) participants had at least one follow-up. Follow-up length was unrestricted to avoid excluding informative records. If a study had been conducted in both an LMIC and an HIC, it was included and only data from the LMIC was reported. Studies testing EIP components with family members of individuals with FEP or CHR were included. Records were excluded if they were a theoretical review/protocol/poster, as these types of publications were unlikely to provide the empirical information sought in this review. No language restrictions were applied.

Key terms

FEP and CHR were defined as reported in the original studies, primarily based on the criteria of the Diagnostic and Statistical Manual of Mental Disorders or the International Classification of Diseases for FEP, and on

the Structured Interview for Psychosis-Risk Syndromes or the Comprehensive Assessment of At-Risk Mental States for CHR. Other diagnostic classification systems were accepted when clearly described and conceptually aligned with these definitions. This aligns with Correll et al.'s (2018) most cited systematic review-meta-analysis on EIP outcomes.³ An EIP component refers to any psychopharmacological, psychological, psychosocial, or nutritional treatment offered to individuals with FEP or CHR. For FEP, records where the only additional components alongside antipsychotic medication and assessment were minocycline, melatonin, metformin, or bifidobacterium were excluded.^{19–22}

EIP components for FEP were guideline-based if included in the 20-item FEP Services Fidelity Scale.²³ For CHR, components were guideline-based if listed in the Canadian Treatment Guideline for Individuals at CHR of Psychosis (nine recommendations, [Table S1](#)), which was developed with rigour and shares similarities with international CHR guidelines, including those from the European Psychiatric Association and National Institute for Health and Care Excellence.²⁴ Strategies not included in these references were categorised as “additional components” (e.g., yoga).

Information sources

In consultation with an EIP expert (SNI) and a university librarian, search terms were generated for prodromal psychosis, FEP, early intervention, and LMICs. The search strategy was applied to PsycINFO, EMBASE, and Medline via Ovid ([Table S2](#), [S3](#) and [S4](#)). Additional records were identified through hand-searching published reviews. The search was conducted on Jan 23, 2022, and updated on May 15, 2024 and on Jan 2, 2026.

Selection process

Two reviewers (RV, NM) independently screened titles, abstracts, and keywords using the software *Rayyan*. They then independently screened the full texts of potentially relevant articles. Disagreements were resolved by consensus or by author SNI, with experience in EIP service delivery and research in HICs and LMICs.

Data collection

A data extraction sheet was piloted on 10% of included records. Two reviewers (RV, NM) independently extracted data on participant demographics, study design, study setting, healthcare context, service characteristics, assessments, and findings. Authors were contacted for clarifications when necessary. Disagreements were resolved by discussion. Evidence of effectiveness was extracted from reported outcomes. Unsubstantiated claims were noted but not considered confirmed evidence.

Data items

For FEP, we selected outcomes from the most cited systematic review on EIP outcomes as indicators of

feasibility, acceptability, and effectiveness: 1) all-cause treatment discontinuation, 2) psychiatric hospitalisation, 3) involvement in school or work, 4) total symptom improvement, 5) global functioning, 6) average number of psychiatric hospitalisations, 7) average bed days during treatment, 8) relapse, 9) remission, 10) recovery, 11) positive symptoms, 12) negative symptoms, 13) general psychopathology, 14) depressive symptoms, and 15) quality of life.³ Other reported outcomes and cost-effectiveness were also extracted. For CHR, although conversion to psychosis was the main outcome, all reported outcomes were included given the anticipated small number of efficacy studies.²⁵ When multiple models were reported, the most fully adjusted was extracted.

Study risk of bias assessment

Two reviewers (RV, NM) independently evaluated the quality of effectiveness studies using the Mixed Methods Appraisal Tool.²⁶ This instrument is a valid and reliable tool to assess the quality of studies with different methodological designs (Table S5). Scores ranged from one (lowest quality) to five (highest quality).

Synthesis methods

Records were categorised by population (FEP or CHR) and by EIP programmes or studies. The term “EIP programmes” was applied when authors identified the delivery of multicomponent interventions to be in specialised services designed to identify and treat

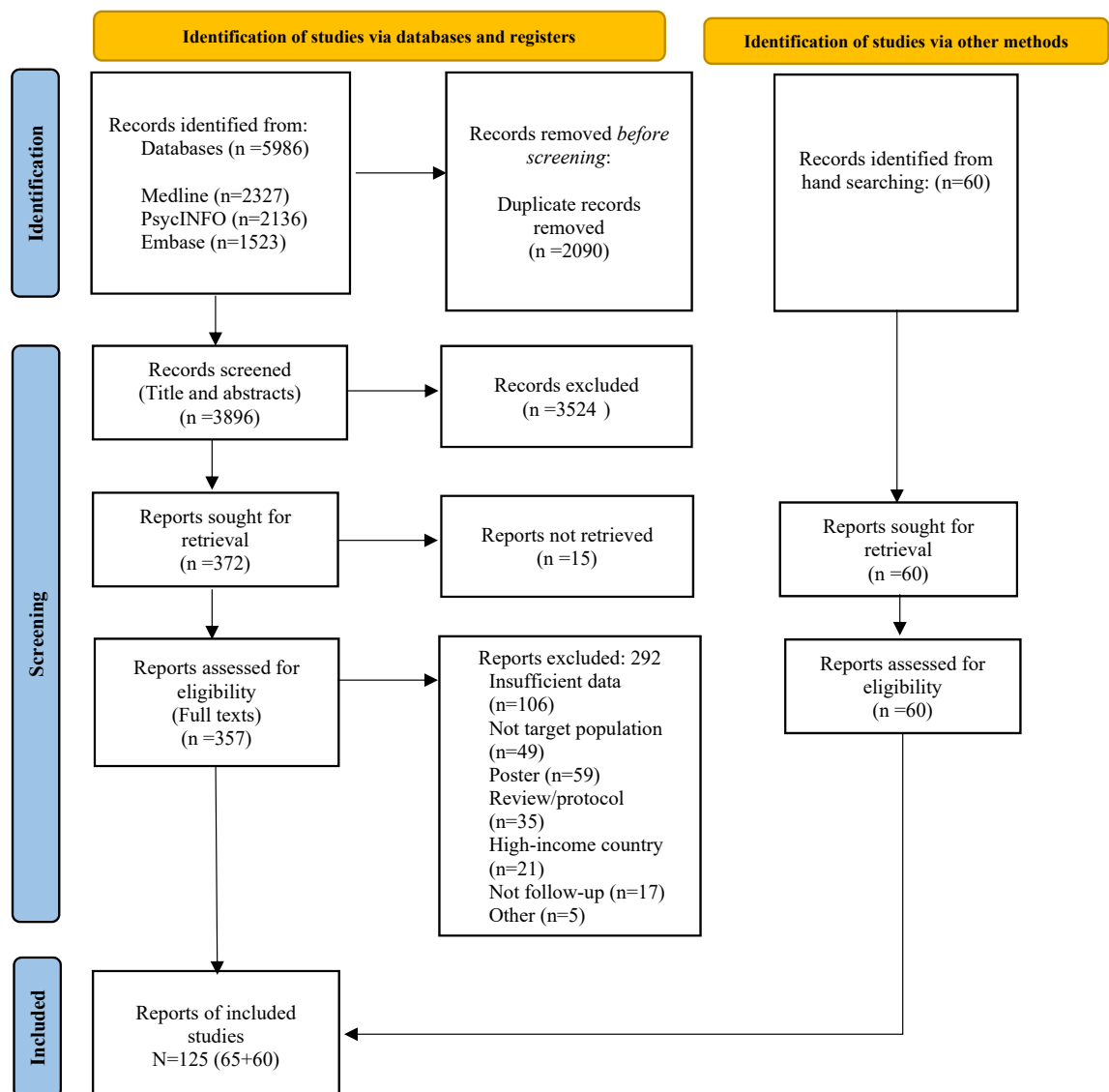


Fig. 1: Flow diagram.

individuals with FEP or at CHR.²⁷ The term “EIP studies” was applied when authors evaluated (1) a single component (besides medication and/or assessment); (2) integrated treatment (combined effect of $\geq$ two components); or (3) participants’ outcomes (e.g., quality of life), without identifying as an EIP programme. Records from the same programme/study were triangulated and unified under their brand name or the name of the home research institution. Records that did not mention either name were categorised as ‘Study’ followed by the name of the study location. A narrative synthesis described (1) settings of programmes/studies, (2) type of EIP component(s) provided, and (3) intervention effectiveness. Because many effectiveness studies examined multiple outcomes simultaneously, we first described the effectiveness of each EIP intervention across its reported outcomes and then synthesised findings aggregated by outcome. A sensitivity analysis compared records with only guideline-based EIP components to those including any treatment components, analysed by number of records. Given substantial heterogeneity across studies, meta-analysis and formal assessments of heterogeneity, publication bias, and certainty of evidence were not performed.

Role of the funding source

The funders had no role in study design, data collection, data analysis, data interpretation, writing or submission.

Results

Included studies

Of the 6046 records identified, 125 met inclusion criteria, representing an average of 152 participants per record (range: 10–1268). Main reasons for exclusion were not reporting treatment components, no follow-up, or populations other than FEP/CHR (Fig. 1). Characteristics of included records, including participants’ sex are shown in Table S6. 20 countries are represented (Fig. 2). The updated search, performed on Jan 2, 2026, yielded an additional 20 records. These additional records were all from countries already represented within this work and were not included in the analysis, though they are included within the Supplementary Materials for transparency (Table S7).

Study characteristics

Of the 125 records, 68 addressed FEP and 58 CHR, with one addressing both. Among FEP records, 36 came from 10 FEP programmes and 32 from 30 studies in 16 LMICs (11.7% of 137 LMICs). Programmes were located in India,²⁸ Brazil,²⁹ Mexico,³⁰ Turkey,³¹ and Malawi,³² as single-site initiatives; only Russia reported national implementation (Table S8).³³ Of the 32 records (30 studies), four evaluated integrated treatment,^{33–36} 17 evaluated a single EIP component,^{37–39} 10 evaluated clinical outcomes,^{40–42} and one was an economic evaluation (Table 1).⁴³ Four records were written in Spanish,

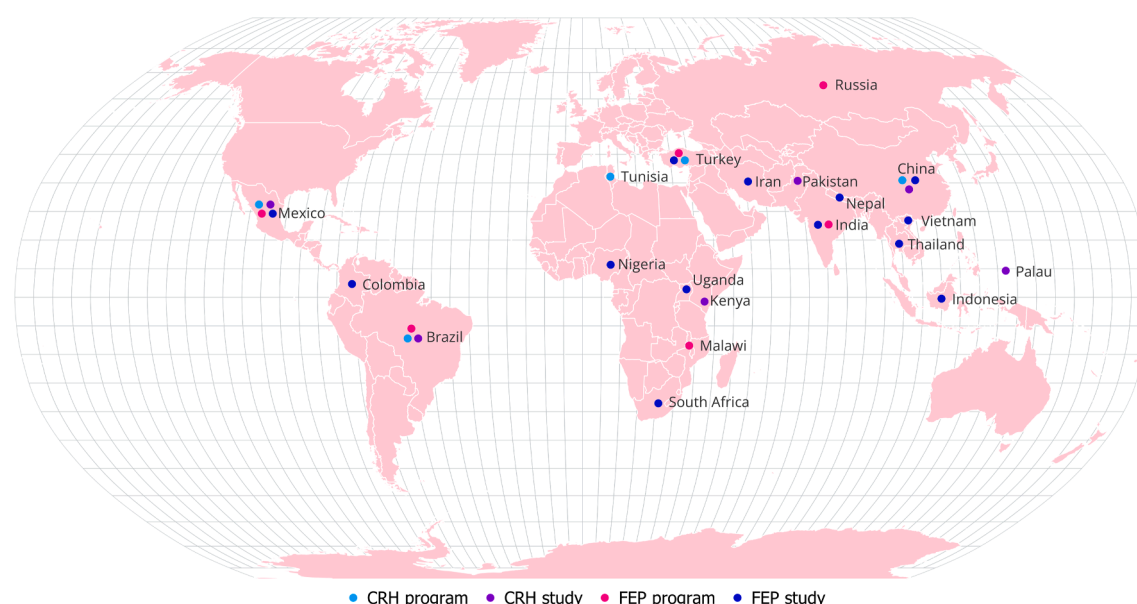


Fig. 2: Geographic distribution of EIP programs and studies in LMICs. EIP: Early Intervention in Psychosis, FEP: First-episode psychosis, CHR: Clinical high-risk for psychosis. The figure shows the FEP and CHR programs and studies identified through our search strategy that met the criteria of providing multicomponent interventions and follow-up of participants.

FEP intervention	Region	Country	Place(s)	N sites	N records
FEP programs (n = 10)					
Schizophrenia Research Foundation	SA	India	Chennai	1	20
All India Institute of Medical Sciences	SA	India	Chennai/New Delhi	2	1
Ribeirao Preto Early Intervention in Psy. P.	LAC	Brazil	Sao Paulo	1	2
Psy. Episode P. of the UNIFESP	LAC	Brazil	Sao Paulo	1	3
Early Psychosis Support Group	LAC	Brazil	Sao Paulo	1	2
Early Intervention Clinic in Psychosis*	LAC	Mexico	Mexico City	1	1
A. P. of Neuropsychiatric and Imaging Study	LAC	Mexico	Mexico City	1	1
Moscow Research Institute of Psychiatry	ECA	Russia	Nationwide	>30	1
First-Episode Schizophrenia Follow-up Project	ECA	Turkey	Istanbul	1	1
Saint John of God Community Services	SSA	Malawi	Mzuzu	1	4
FEP studies (n = 30)					
Christian Medical College	SA	India	Vellore	1	2
NIMHANS in Bangalore ¹	SA	India	Bangalore	1	1
NIMHANS in Bangalore ²	SA	India	Bangalore	1	1
NIMHANS in Bangalore ³	SA	India	Bangalore	1	1
Silver Mind Hospital	SA	India	Mumbai	1	1
Central Institute in Psychiatry in Ranchi	SA	India	Ranchi	1	1
Medical College in Nepal	SA	Nepal	Chitwan	1	1
Study in Yogyakarta	EAP	Indonesia	Yogyakarta	4	1
Da Nang Psychiatric Hospital	EAP	Vietnam	Da Nang	1	1
Ten-site study in China	EAP	China	–	10	2
Study in Xuhui and HongKou	EAP	China	Shanghai	2	1
Study in Shanghai	EAP	China	Shanghai	6	1
Tongde Hospital	EAP	China	Zhejiang	1	1
Beijing Anding Hospital	EAP	China	Beijing	1	1
Suzhou Guangji Hospital	EAP	China	Jiangsu	1	1
Study in Jilin	EAP	China	Jilin	2	1
Study in China	EAP	China	–	2	1
Study in Shanghai and Changsha	EAP	China	Shanghai/Changsha	2	1
Second Xiangya Hospital	EAP	China	Changsha	1	1
Psychiatric Hospital in Thailand	EAP	Thailand	Northern Thailand	1	1
N. I. of Psychiatry Ramon de la Fuente Muñiz	LAC	Mexico	Mexico City	1	1
Nervous System Research Centre	LAC	Colombia	Bogotá	1	1
Bolu Community Mental Health Centre	ECA	Turkey	Bolu	1	1
University Hospital in Turkey	ECA	Turkey	–	1	1
Roodebeek Hospital	MENA	Iran	Tehran	1	1
University College Hospital in Nigeria	SSA	Nigeria	Ibadan	1	1
Federal Neuro-Psychiatric Hospital in Benin	SSA	Nigeria	Benin	1	1
Study in Ibadan and Cape Town	SSA	Nigeria/South Africa	Ibadan/Cape Town	2	1
Butabika National Referral Mental Hospital	SSA	Uganda	Kampala	1	1
Psychiatric Hospital in Cape Town	SSA	South Africa	Cape Town	1	1

FEP: First-episode psychosis, LMIC: Low- and middle-income country, Psy: Psychosis, A: Adolescent, P: Program, UNIFESP: Federal University of Sao Paulo, NIMHANS: National Institute of Mental Health and Neuroscience, N: National, I: Institute, SA: South Asia, LAC: Latin America and the Caribbean, ECA: Europe and Central Asia, SSA: Sub-Saharan Africa, MENA: Middle East and North Africa, EAP: East Asia and Pacific. 1,2,3 (superscripts): Different studies were conducted at the same site. *Record counted for both CHR and FEP.

Table 1: FEP interventions in LMICs.

Portuguese, Persian and Turkish, and the rest in English. Table S9 shows eligibility criteria for FEP programmes and studies.

Among the 58 CHR records, 40 were from eight CHR programmes and 18 from eight studies across eight LMICs (5.8% of the LMICs). Programmes were located in Brazil,⁴⁴ Mexico,⁴⁵ China,⁴⁶ Turkey,⁴⁷ and Tunisia,¹⁵ all of which were in tertiary or university-based healthcare settings (Table S10). Of the 18 CHR records, four

evaluated the effectiveness of an intervention,^{48–51} and 14 clinical outcomes (Table 2).^{16,17,52} Eligibility criteria for CHR programmes and studies are available in Table S11. The geographic distribution of FEP and CHR programmes and studies is shown in Fig. 2.

Of the 125 records, 27 reported effectiveness outcomes for FEP (five from FEP programmes, 22 from studies). Of these, nine evaluated integrated treatment, 11 a single EIP component and seven exclusively a

CHR intervention	Region	Country	Place(s)	N sites	N records
CHR programs (n = 8)					
Evaluation and Follow-up of Adolescent and Young Adults	LAC	Brazil	Sao Paulo	1	1
Recognition P. and Intervention in Risk Mental States	LAC	Brazil	Sao Paulo	1	5
Early Intervention Clinic in Psychosis ^a	LAC	Mexico	Mexico City	1	1
A. P. of Neuropsychiatric and Imaging Study	LAC	Mexico	Mexico City	1	2
Shanghai at Risk for Psychosis Project ^b	EAP	China	Shanghai	1	23
Psychotic Disorders Research Program	ECA	Turkey	Istanbul	1	6
Clinical High-Risk Program in Tunisia	MENA	Tunisia	Tunis	1	1
Tunisian Early Intervention of Psychosis Project	MENA	Tunisia	Tunis	1	1
CHR studies (n = 8)					
Subclinical Symptoms and Prodromal Psychosis Project	LAC	Brazil	Sao Paulo	1	8
Longitudinal Study in Early Detection of Psychosis	LAC	Mexico	Mexico City	1	2
Palau Early Psychosis Study	EAP	Palau	–	1	2
Study in Tongji University	EAP	China	Shanghai	1	1
Beijing Anding Hospital	EAP	China	Beijing	1	1
Suzhou Guangji Hospital ^c	EAP	China	Suzhou/Shanghai	2	1
Study in Pakistan	SA	Pakistan	Lahore/Karachi/Rawalpindi	3	2
Study in Kenya	SSA	Kenya	Machakos	1	1

CHR: Clinical high-risk for psychosis, LMIC: Low- and middle-income country, A: Adolescent, P: Program, LAC: Latin America and the Caribbean, ECA: Europe and Central Asia, MENA: Middle East and North Africa, EAP: East Asia and Pacific, SA: South Asia, SSA: Sub-Saharan Africa. ^aRecord counted for both CHR and FEP. ^bIncludes the Shanghai At Risk for Psychosis extended program. ^cIn collaboration with Shanghai Mental Health Center.

Table 2: CHR interventions in LMICs.

non-*a priori* outcome. Six records reported effectiveness outcomes for CHR (two from CHR programmes, four from studies). The quality scores of these 33 records ranged from one to five, with an overall average of 3.5 (Table S5).

Availability of EIP components

FEP programmes (36 records) offered both guideline-based and additional components, averaging 10 components over 28 months. Beyond clinical assessments and antipsychotics, the most frequent guideline-based components were patient psychoeducation, and family education and support. CBT and psychosocial interventions, such as case management, educational support, and substance use treatment, were less frequently reported. Common additional components were non-CBT psychotherapy, multidisciplinary team and occupational therapy. Only two programmes (India and Brazil) reported cultural adaptation. The Indian site emphasised family involvement in treatment and home-based cognitive retraining focused on household chores.²⁸ The Brazilian programme mentioned culturally sensitive interventions without details (Table 3 and Table S12).⁵³

FEP studies (32 records) included three randomised controlled trials of integrated treatment, all including family education and support.^{34–36} One cohort study evaluated the effectiveness of antipsychotics along with assertive monitoring.⁵⁴ Seventeen records tested single EIP components (besides medication and clinical assessment),^{55–57} mainly patient psychoeducation, and family education and support. One record was a cost-effectiveness study.⁴³ In ten records, participants

regularly received various components,^{40–42} and clinical outcomes were measured. On average, studies offered five components for 19 months. Cultural adaptation was present in three studies evaluating psychoeducation,^{38,57,58} a family intervention,⁵⁵ and a local diagnostic system (Table 3 and Table S12).⁵⁹

CHR programmes (40 records) delivered both guideline-based and additional components, averaging seven components. All involved evaluation by a professional trained in CHR. Only two programmes in Tunisia and one in Mexico offered most guideline-based components,^{15,60,61} while the remaining did not report offering CBT or psychosocial interventions. Additional components included antipsychotic medication and omega-3 fatty acids. No programme reported cultural adaptation. Two programmes did not specify treatment length^{47,62}; three did not limit the length of follow-up^{44,46,61}; three reported an average of 14 months (Table 4 and Table S13).

CHR studies (18 records) assessed systemic therapy,⁴⁸ eye movement desensitisation and reprocessing,⁵⁰ omega-3 fatty acids (with/without minocycline),⁴⁹ and mobile technology.⁵¹ The remaining 14 followed CHR cohorts, while examining social, clinical, and biological outcomes,^{17,63} establishing identification systems within schools,⁶⁴ and assessing predictors of conversion to psychosis.¹⁶ On average, studies offered four components over 17 months. None reported cultural adaptation (Table 4 and Table S13).

Effectiveness of EIP components

Regarding FEP, of 20 records on *a priori* outcomes, nine reported integrated treatment (Table 5).

FEP interventions	Guideline-based components ^a																	Duration (months)
	Clinical assessment	Psychiatric management	Antipsychotic medication	Patient psychoeducation	Family education and support	Cognitive behavioural therapy	Supporting health	Case management	Supported employment	Educational support	Active engagement and retention	Annual comprehensive assessment	Substance abuse treatment	Crisis intervention	Additional component	Cultural adaptation		
FEP programs (n=10)																		
Schizophrenia Research Foundation																	24	
All India Institute of Medical Sciences																	12	
Ribeirao Preto Early Intervention in Psy. P.																	24	
Psy. Episode P. of the UNIFESP																	24	
Early Psychosis Support Group																	36	
Early Intervention Clinic in Psychosis																	24	
A. P. of Neuropsychiatric and Imaging Study																	Open	
Moscow Research Institute of Psychiatry																	-	
First-Episode Schizophrenia Follow-up Project																	58	
Saint John of God Community Services																	18	
FEP studies (n=30)																		
Christian Medical College																	60	
NIMHANS in Bangalore ¹																	12	
NIMHANS in Bangalore ²																	6	
NIMHANS in Bangalore ³																	3	
Silver Mind Hospital																	120	
Central Institute in Psychiatry in Ranchi																	1.5	
Medical College in Nepal																	12	
Study in Yogyakarta																	6	
Da Nang Psychiatric Hospital																	6	
Ten-site study in China																	12	
Study in Xuhui and HongKou																	24	
Study in Shanghai																	18	
Tongde Hospital																	1	
Beijing Anding Hospital																	12	
Suzhou Guangji Hospital																	18	
Study in Jilin																	18	
Study in China																	24	
Study in Shanghai and Changsha																	12	
Second Xiangya Hospital																	2	
Psychiatric Hospital in Thailand																	12	
N. I. of Psychiatry Ramon de la Fuente Muñiz																	12	
Nervous System Research Center																	60	
Bolu Community Mental Health Center																	6	
University Hospital in Turkey																	2.3	
Roozbeh Hospital																	24	
University College Hospital in Nigeria																	12	
Federal Neuro-Psychiatric Hospital in Benin																	6	
Study in Ibadan and Cape Town																	12	
Butabika National Referral Mental Hospital																	-	
Psychiatric Hospital in Cape Town																	24	

EIP: Early intervention in psychosis, FEP: First-episode psychosis, LMIC: Low- and middle-income country, Psy: Psychosis, A: Adolescent, P: Program, UNIFESP: Federal University of Sao Paulo, NIMHANS: National Institute of Mental Health and Neurosciences, N: National, I: Institute, 1,2,3 (superscripts): Different studies were conducted at the same site.

^a "Psychiatric management" was considered part of "clinical evaluation" and "antipsychotic medication".

White cell: Component not present. Light grey cell: Component present. Dark grey cell: Component evaluated in studies reporting effectiveness.

Table 3: EIP components offered to individuals with FEP in LMICs.

CHR intervention	Guideline-based components							Additional components	Cultural adaptation	Duration (months)
	Comprehensive clinical assessment	Assessment by a trained specialist	Cognitive behavioural therapy	Treatment of comorbid conditions	Prevent the development of functional deficits	Monitoring by a mental health provider	Monitoring for up to 3 years			
<i>CHR programs (n=8)</i>										
Evaluation and Follow-up of Adolescent and Young Adults										-
Recognition P. and Intervention in Risk Mental States										Open
Early Intervention Clinic in Psychosis										24
A. P. of Neuropsychiatric and Imaging Study										Open
Shanghai at Risk for Psychosis Project ^a										Open
Psychotic Disorders Research Program										-
Clinical High-Risk Program in Tunisia										6
Tunisian Early Intervention of Psychosis Project										12
<i>CHR studies (n=8)</i>										
Subclinical Symptoms and Prodromal Psychosis Project										30
Longitudinal Study in Early Detection of Psychosis										-
Palau Early Psychosis Study										48
Study in Tongji University										6
Beijing Anding Hospital										3
Suzhou Guangji Hospital ^b										3
Study in Pakistan										12
Study in Kenya										20
EIP: Early intervention in psychosis, CHR: Clinical high-risk for psychosis, LMIC: Low- and middle- income country, A: Adolescent, P: Program. ^a Includes the Shanghai At Risk for Psychosis extended program. ^b In collaboration with Shanghai Mental Health Center. White cell: Component not present. Light grey cell: Component present. Dark grey cell: Component evaluated in studies reporting effectiveness.										

Table 4: EIP components offered to individuals at CHR in LMICs.

Table 4: EIP components offered to individuals at CHR in LMICs.

A Mexican trial showed 56.4% recovery in the intervention group, compared to 2.9% in the control group.³⁴ A Chinese trial reported lower treatment discontinuation in the intervention group (32.8%) than in the control group (46.8%).³⁶ Both outperformed antipsychotic medication alone on other outcomes. An Iranian trial found no differences between integrated treatment and antipsychotic medication.³⁵ Observational studies indicated higher symptom remission and lower unemployment rates with integrated treatment in Russia,³³ and greater improvements in negative symptoms and functioning in India than in Canada.^{65,66} A combined South Africa and Nigeria cohort reported 82% treatment response with antipsychotics plus assertive monitoring.⁵⁴ Cost-effectiveness was shown in Brazil (EIP programme) and China (study context).^{43,67}

Eleven records evaluated single EIP components for the *a priori* outcomes (Table 6). Seven antipsychotics combined with case management yielded equivalent effectiveness in improving symptoms and functioning.⁶⁸ CBT,⁶⁹ patient psychoeducation,^{57,58} interpersonal psychotherapy,⁷⁰ and electroconvulsive therapy,³⁹ when added to antipsychotics, were associated with greater

improvements in psychotic symptoms, functioning, and other outcomes. Family psychoeducation and support, combined with antipsychotics, was associated with greater enhancements in quality of life, medication adherence, and reduced hospital readmission than medication alone.^{38,55,56} Cognitive training or family therapy focused on cognitive rehabilitation with treatment as usual (medication and psychoeducation) did not yield additional improvements in psychotic symptoms compared to treatment as usual.^{37,59}

Table S14 and Fig. 3 summarise the effectiveness of EIP interventions aggregated by outcome and study quality. Treatment discontinuation was one of the most consistently desirably impacted outcomes, with four RCTs reporting favourable effects, particularly for interventions including patient psychoeducation and family education and support. Overall, the evidence suggests promising effects for seven outcomes, mixed effects for five (although the studies with no benefits tended to be lower quality), and two outcomes that were understudied.

Nineteen records reported non-*a priori* outcomes; seven focused exclusively on them (Table S15 and S16).^{28,71–76} These included insight, knowledge, stigma,

FEP intervention (First author, year)	Study type (Duration)	Intervention (n) Comparator (n)	Outcomes* (Measurements)	Findings	Statistical analysis	QS
RCTs (n = 3)						
N. I. of Psychiatry Ramon de la Fuente Muñiz (Valencia, 2012)	Single site RCT (12 months)	TAU + patient psychoeducation, family psychoeducation (n: 39) TAU: Antipsychotic medication (n: 34)	Functional recovery (Symptomatic and functional remission) Symptomatic remission (score ≤ 3 in 8 specified PANSS items for at least 6 months) Functional remission (GAF score ≥ 65) Psychotic symptoms (PANSS) Positive symptoms (PANSS) Negative symptoms (PANSS) G. psychopathology (PANSS) Functioning (GAF) Relapse (20% worsening on the PANSS score from baseline evaluation) Rehospitization (Admission to a hospitalisation unit) Medication compliance	Functional recovery: $p < 0.01$ Intervention: 56.4% Comparator: 2.9% Symptomatic remission: $p < 0.01$ Intervention: 94.9% Comparator: 58.8% Functional remission: $p < 0.01$ Intervention: 56.4% Comparator: 3.6% Psychotic symptoms: $p < 0.01$ Intervention $\Delta \bar{x}$: -46.7 Comparator $\Delta \bar{x}$: -26.1 Positive symptoms: nr ^a Intervention $\Delta \bar{x}$: -10.7 Comparator $\Delta \bar{x}$: -6.6 Negative symptoms: $p < 0.01$ Intervention $\Delta \bar{x}$: -12.7 Comparator $\Delta \bar{x}$: -6.9 G. psychopathology: $p < 0.05$ Intervention $\Delta \bar{x}$: -23.3 Comparator $\Delta \bar{x}$: -12.6 Functioning: $p < 0.01$ Intervention $\Delta \bar{x}$: 23.8 Comparator $\Delta \bar{x}$: 1.9 Relapse: $p < 0.01$ Intervention: 10.3% Comparator: 35.7% Rehospitalization: nr Intervention: 5.1% Comparator: 10.7% Medication compliance: $p < 0.01$ Intervention: 85.0% Comparator: 67.6%	Analysis of quantitative outcomes with repeated-measures ANOVA (group $\times$ time interaction) Analysis of categorical outcomes with McNemar. ^a p-Value not reported for interaction of group $\times$ time. Statistically significant for the main effect for time analysis only ($p < 0.001$).	3
Ten-site study in China (Guo, 2010)	Multi-site RCT (12 months)	TAU + patient psychoeducation, family intervention, skills training, and CBT (n: 635) TAU: Antipsychotic medication (n: 633)	Primary outcomes: Treatment discontinuation or change (Five specific criteria listed in the report) Relapse (Six specific criteria listed in the report) Secondary outcomes: Psychotic symptoms (PANSS) Functioning (GAS) Employment or accessed education (No definition provided) Quality of life (SF-36)	Treatment discontinuation or change: HR: 0.6 (95% CI: 0.5-0.7) Intervention: 32.8% Comparator: 46.8% Relapse: HR:0.6 (95% CI: 0.4-0.7) Intervention: 14.6% Comparator: 22.5% Psychotic symptoms: F:0.4, p:0.81 Intervention $\Delta \bar{x}$: -9.9 Comparator $\Delta \bar{x}$: -8.9 Functioning: F:4.3, p:0.002 Intervention $\Delta \bar{x}$: 8.8 Comparator $\Delta \bar{x}$: 6.7 Employment or accessed education: χ^2 :10.1, p:0.001 Intervention: 30.1% Comparator: 22.2% Quality of life: All $p \leq 0.02$ (4 out of 8 SF-36 domains)	Harzard ratios and 95% CIs were calculated. Mixed effects models for repeated-measures analysis (group $\times$ time interaction)	4
Roozbeh Hospital (Shahrivar, 2011)	Single site RCT (24 months)	TAU + family psychoeducation, and telephone follow-up (n: 20) TAU: Antipsychotic medication (n: 20)	Positive symptoms (PANSS) Negative symptoms (PANSS) G. psychopathology (PANSS) Depressive symptoms (HAM-D) Functioning (GAF, CGAS)	Positive symptoms: $p: 0.610$ Negative symptoms: $p: 0.231$ G. Psychopathology: $p: 0.930$ Depressive symptoms: $p: 0.756$ Functioning (GAF): $p: 0.768$ Functioning (CGAS): $p: 0.958$	Chi-square test Independent sample t-test.	1

(Table 5 continues on next page)

FEP intervention (First author, year)	Study type (Duration)	Intervention (n) Comparator (n)	Outcomes* (Measurements)	Findings	Statistical analysis	QS
(Continued from previous page)						
Observational studies (n = 4)						
Moscow Research Institute of Psychiatry (Zaytseva, 2010)	Cohort-2 groups (60 months)	Atypical antipsychotics, psychoeducation, individualised family intervention, supportive therapy and case management (n: 114) Regular care-not specified (n: 119)	Relapse (No definition provided) Remission (No definition provided) Unemployment (No definition provided) Adherence to therapy (No definition provided)	Remission Intervention: 46.5% Comparator: 36.7% Relapse rates ^a Intervention: $\bar{x}$:0.2, sd: 0.5 Comparator: $\bar{x}$:0.6, sd: 0.9 Unemployment Intervention: 17.7% Comparator: 47.1% Adherence to therapy Intervention: 48.0% Comparator: 12.0%	Type of statistical analysis not specified ^a Uninterpretable value.	1
Schizophrenia Research Foundation (Malla, 2020)	Cohort: 2 groups (24 months)	Multicomponent intervention in LMIC (n = 165) Same intervention in HIC (n = 168)	Positive symptoms (Scales for the assessment of positive symptoms) Negative symptoms (Scale for the assessment of negative symptoms)	Positive symptoms: F: 44.1, p < 0.001 LMIC $\Delta \bar{x}$: -16.8 HIC $\Delta \bar{x}$: -29.4 Negative symptoms: F: 7.4, p:0.002 LMIC $\Delta \bar{x}$: -17.4 HIC $\Delta \bar{x}$: -11.9	MANOVA, adjusted for confounders (group × time interaction).	5
Schizophrenia Research Foundation (Iyer, 2010)	Cohort: 2 groups (12 months)	Multicomponent intervention in LMIC (n = 61) Multicomponent intervention in HIC (n = 88)	Psychotic symptoms (PANSS) Positive symptoms (PANSS) Negative symptoms (PANSS) G. psychopathology (PANSS) Functioning (SOFAS)	Psychotic symptoms: F:7.0, p:0.009 LMIC $\Delta \bar{x}$: -36.2 HIC $\Delta \bar{x}$: -25.7 Positive symptoms: F:1.6, p:0.21 LMIC $\Delta \bar{x}$: -9.9 HIC $\Delta \bar{x}$: -11.3 Negative symptoms: F:26.4, p < 0.001 LMIC $\Delta \bar{x}$: -3.4 HIC $\Delta \bar{x}$: 4.6 G. psychopathology: F:2.8; p:0.09 LMIC $\Delta \bar{x}$: -14.6 HIC $\Delta \bar{x}$: -10.6 Functioning: F:12.9, p < 0.001 LMIC $\Delta \bar{x}$: 35.6 HIC $\Delta \bar{x}$: 19.27	ANCOVA (group × time interaction)	5
Study in Ibadan and Cape Town (Chiliza, 2006)	Cohort: pre-post (12 months)	Depot antipsychotic + Assertive monitoring program (n, at 12-month = 149) (n, at baseline = 207)	Remission ($\geq 50\%$ PANSS total score improvement) Psychotic symptoms (PANSS) Positive symptoms (PANSS) Negative symptoms (PANSS) General psychopathology (PANSS) Functionality (SOFAS) Quality of life (World Health Organisation quality of life scale) Depressive symptoms (Calgary depression scale for schizophrenia)	Treatment response: 170 of the 207 participants (82%). Psychotic symptoms: p < 0.001 One-year: $\bar{x}$: 42.5, sd:11.4 Baseline: $\bar{x}$: 86.5, sd:19.2 Positive symptom: p < 0.001 One-year: $\bar{x}$: 8.8, sd:3.0 Baseline: $\bar{x}$: 22.3, sd: 5.8 Negative symptoms: p < 0.001 One-year: $\bar{x}$: 12.2, sd: 4.7 Baseline: $\bar{x}$: 23.2, sd: 8.1 General psychopathology: p < 0.001 One-year: $\bar{x}$: 21.5, sd: 5.7 Baseline: $\bar{x}$: 40.9, sd:10.1 Functioning: p < 0.001 One-year: $\bar{x}$: 70.1, sd: 13.3 Baseline: $\bar{x}$: 43.9, sd:11.9 Quality of life: p < 0.001 One-year: $\bar{x}$: 13.7, sd: 2.4 Baseline: $\bar{x}$: 11.5, sd: 3.1 Depressive symptoms: p < 0.001 One-year: $\bar{x}$: 1.4, sd: 3.0 Baseline: $\bar{x}$: 2.8, sd: 3.9	Two-tailed Wilcoxon signed rank test	3

(Table 5 continues on next page)

FEP intervention (First author, year)	Study type (Duration)	Intervention (n) Comparator (n)	Outcomes* (Measurements)	Findings	Statistical analysis	QS
(Continued from previous page)						
Cost-effectiveness (n = 2)						
Early Psychosis Support Group (Aceituno, 2024)	Cohort: 2 groups (12 months)	Clinical assessment + antipsychotic medication + patient psychoeducation, etc. (n = 317) Regular care: medication + psychosocial intervention ("rarely implemented")	Cost-effectiveness	Multicomponent intervention: Mean costs (R\$): 148,757.2 Mean effects (QALYs): 6.18 Regular care Mean costs (R\$): 144,278.8 Mean effects (QALYs): 5.89 Incremental costs (R\$): 4478 Incremental effects (QALYs): 0.29 Incremental cost-effectiveness ratio: 15,495	Cost-effectiveness analysis using the incremental cost-effectiveness ratio	4
Ten-site study in China (Zhang, 2014)	Multi-site RCT (12 months)	TAU + psychoeducation, family intervention, skills training, CBT (n = 580) TAU: Antipsychotic medication (n = 604)	Cost-effectiveness	Incremental costs (US\$): \$6.4 Incremental effects (QALYs): 0.031 Incremental cost-effectiveness ratio: 1819.4	Cost-effectiveness analysis using the incremental cost-effectiveness ratio	4
FEP: First-episode psychosis, HIC: High-income country, LMIC: Low- and middle-income country, N: National, I: Institute, RCT: Randomised controlled trial, CBT: Cognitive-behavioural therapy, TAU: Treatment as usual, QALY: Quality-adjusted life-years, R\$: Brazilian Real, US\$: United States Dollar, G: General, HR: Hazard ratio, CI: Confidence interval, nr: Not reported, PANSS: Positive and negative syndrome scale, GAF: Global assessment of functioning scale, GAS: Global assessment scale, SF-36: Medical outcomes study 36-Item short form health survey, HAM-D: Hamilton depression rating scale, CGAS: Children global assessment scale, SOFAS: Social and occupational functioning assessment scale, QS: Quality Score using the Mixed Methods Appraisal Tool (Range:1-5, lowest to highest), sd: standard deviation. $\Delta \bar{x}$: Difference between mean values at endpoint and baseline. Negative values represent improvements for psychotic (positive, negative and general psychopathology symptoms) and depressive symptoms. Positive values represent improvements in functioning and quality of life. *p < 0.05 was considered statistically significant as per threshold for significance adopted by included studies. Outcomes in bold indicate no statistically significant difference.						

Table 5: Effectiveness of integrated treatment for individuals with FEP in LMICs.

satisfaction, cognition, physical health indices such as weight gain, expressed emotion, quality of life, psychological health, patient disengagement, and family engagement.

Regarding CHR, only three of six records evaluated conversion to psychosis. A Pakistani record reported higher transition (17.3%) with omega-3, either alone or combined with minocycline, compared with those not receiving omega-3 (10.4%).⁴⁹ Two Chinese records reported that antipsychotic treatment did not prevent psychosis onset.^{46,77} Conversely, positive and depressive symptoms, social support, and self-esteem improved among persons randomised to systemic therapy compared to controls.⁴⁸ Eye movement desensitisation and reprocessing was reported as significantly reducing post-traumatic stress scores and attenuated positive symptoms, and yielded higher remission compared to the waitlist group (60.7% vs. 31.0%).⁵⁰ The group randomised to mobile technology had enhanced cognitive function, specifically attention/vigilance, in CHR.⁵¹

Four of the 125 records would have been excluded if only guideline-based components were considered, reducing FEP studies from 30 to 26. These included studies evaluating the long-term abilities of people with FEP to live and work independently⁷⁸; cognitive training,⁷⁶ interpersonal group psychotherapy,⁷⁰ and electroconvulsive therapy.³⁹ Including them did not alter conclusions but highlighted additional components used in LMICs.

Discussion

We conducted the first comprehensive systematic review of the availability and effectiveness of treatment components for FEP and CHR in LMICs. Our analysis of studies from 20 countries, despite their heterogeneous study quality, allows the following conclusions: (1) multicomponent interventions are being implemented for both FEP and CHR in programmes and studies; (2) psychological and psychosocial components remain scarce; (3) for FEP, multicomponent interventions are associated with greater clinical, functional and cost-effectiveness benefits than medication alone; and (4) for CHR, evidence on the effectiveness of treatment components is limited. Our review synthesises progress and highlights gaps in implementing EIP in LMICs.

FEP programmes in LMICs resembled those in HICs in the types of components provided. This is unsurprising, as EIP programmes in LMICs have emulated those in HICs.¹³ However, we cannot comment on the intensity or duration of each component as this was rarely reported. Programmes often lacked guideline-based psychological and psychosocial components, including CBT, case management, supported employment, educational support, and substance use interventions, despite strong evidence for these from HICs.⁷⁹ Where CBT was mentioned, it was often unclear whether it was tailored for psychosis, as recommended,⁸ or generic. Prior reports have also noted this scarcity of CBT and psychosocial

FEP intervention (First author, year)	Study type (Duration)	Intervention (n) Comparator (n)	Outcomes* (Measurement)	Findings	Statistical analysis	QS
Guideline-based components (n = 8)						
Antipsychotic medication						
Study in Xuhui and HongKou (Zhang, 2016)	Cohort (pre-post) (24 months)	Case management + Antipsychotic monotherapy: aripiprazole or clozapine or chlorpromazine or olanzapine or perphenazine or quetiapine or risperidone (n = 312)	Psychotic symptoms (PANSS) Positive symptoms (PANSS) Negative symptoms (PANSS) Functioning (Personal and social performance scale) Medication adherence (Medication adherence rating scale)	Psychotic symptoms F: 0.85, p: 0.64 Positive symptoms F: 0.97, p: 0.49 Negative symptoms F: 0.80, p: 0.70 Functioning F: 0.14, p: 1.00 Medication adherence F: 1.35, p: 0.24	Mixed-effect models for repeated measures (group x time analysis).	5
CBT						
Beijing Anding Hospital (Liu, 2019)	A pilot RCT (12 months)	TAU + Brief CBT intervention (n = 40) TAU: Antipsychotic medication + case management (n = 40)	<i>Primary outcome</i> Relapse (rating of 6 or 7 on PANSS thought-disorder items, or 2 or more of these items rating 5 or above) Hospitalisation (No definition provided) Psychotic symptoms ¹ (PANSS) Psychotic symptoms ² (PSYRATS) Positive symptoms (PANSS) Negative symptoms (PANSS) G. psychopathology (PANSS) <i>Secondary outcome</i> Functioning (Personal and social performance scale)	Relapse ^a Intervention: 10% Comparator: 32.5% Hospitalisation: χ^2 : 3.53, p: 0.06 Intervention: 7.5% Comparator: 20% Psychotic symptoms ¹ : F: 3.4, p: 0.04 Intervention $\Delta \bar{x}$: -25.28 Comparator $\Delta \bar{x}$: -17.07 Psychotic symptoms ² : F: 1.945, p: 0.024 ^b Intervention $\Delta \bar{M}$: -25.5 Comparator $\Delta \bar{M}$: -25.5 Positive symptoms ^c : F: 1.3, p: 0.265 Intervention $\Delta \bar{x}$: -8.45 Comparator $\Delta \bar{x}$: -6.65 Negative symptoms: F: 1.4, p: 0.23 ^b Intervention $\Delta \bar{M}$: -4.0 Comparator $\Delta \bar{M}$: -4.5 G. psychopathology: F: 3.9, p: 0.027 ^b Intervention $\Delta \bar{M}$: -10.5 Comparator $\Delta \bar{M}$: -10.5 Functioning: F: 3.1; p: 0.039 Intervention $\Delta \bar{x}$: 22.85 Comparator $\Delta \bar{x}$: 15.06	Repeated-measures ANOVA (Group x time analysis) ^a Not reported statistical test results. ^b Variable with nonnormal distribution; data were reciprocally transformed before repeated-measures ANOVA to approximate normality. ^c Not significant for group x time analysis.	5
Patient psychoeducation						
Study in Jilin (Chien, 2019)	Multi-site RCT (18 months)	TAU + Mindfulness-based psychoeducation program (n = 60) TAU + standard psychoeducation (n = 60) Comparator: TAU: Antipsychotic medication, supporting health, active engagement and retention (n = 60)	<i>Primary outcome</i> Functioning (SLOF) <i>Secondary outcome</i> Duration of psychiatric re-hospitalisation Average number of re-hospitalisations Psychotic symptoms (PANSS)	Functioning: F: 8.1, p < 0.005 Intervention $\Delta \bar{x}$: 53.8 Comparator $\Delta \bar{x}$: 10 Average number of re-hospitalisations: F: 3.80, p: ns Intervention $\Delta \bar{x}$: -0.6 Comparator $\Delta \bar{x}$: 0.1 Duration of re-hospitalisations: F: 6.82, p < 0.001 Intervention $\Delta \bar{x}$: -9.3 Comparator $\Delta \bar{x}$: 2.7 Psychotic symptoms: F: 6.3, p < 0.01 Intervention $\Delta \bar{x}$: -35 Comparator $\Delta \bar{x}$: 15 Positive symptoms: F: 7.5, p < 0.01 Intervention $\Delta \bar{x}$: -11.3 Comparator $\Delta \bar{x}$: 5.8 Negative symptoms: F: 4.12, p < 0.05 Intervention $\Delta \bar{x}$: -5.7 Comparator $\Delta \bar{x}$: 1.9	Manova (Group x time interaction)	5

(Table 6 continues on next page)

FEP intervention (First author, year)	Study type (Duration)	Intervention (n) Comparator (n)	Outcomes* (Measurement)	Findings	Statistical analysis	QS
(Continued from previous page)						
Study in China (Chien, 2017)	Multi-site RCT (18 months)	TAU + Mindfulness-based psychoeducation group (n = 114) TAU + standard psychoeducation (n = 114) Comparator: TAU: Antipsychotic medication, finance assistance, and psychological therapy. (n = 114)	<i>Primary outcomes</i> Length of re-hospitalisations Average number of re-hospitalisations Remission (4-month simultaneous ratings of all individual items in PANSS as score ≤ 3) Psychotic symptoms (PANSS) <i>Secondary outcomes</i> Functioning (SLOF)	Length of re-hospitalisations: F:5.23; p < 0.005 Intervention $\Delta \bar{x}$: -9.1 Comparator $\Delta \bar{x}$: 2.7 Average number of re-hospitalisations: F:3.78, p $\geq$ 0.05 Intervention $\Delta \bar{x}$: -1 Comparator $\Delta \bar{x}$: -0.2 Remission: RR: 2.0 (95%CI: 1.1-4.2) Intervention: 38.9% Comparator: 7.4% Psychotic symptoms: F:6.1; p < 0.005 Intervention $\Delta \bar{x}$: -16 Comparator $\Delta \bar{x}$: 8.8 Positive symptoms: F:6.48; p < 0.005 Intervention $\Delta \bar{x}$: -8.1 Comparator $\Delta \bar{x}$: 3.7 Negative symptoms: F:5.10; p < 0.01 Intervention $\Delta \bar{x}$: -0.9 Comparator $\Delta \bar{x}$: 2.4 Functioning: F: 6.40; p < 0.005 Intervention $\Delta \bar{x}$: 59 Comparator $\Delta \bar{x}$: -6.7	MANOVA (Group $\times$ time interaction)	4
Family psychoeducation Da Nang Psychiatric Hospital (Ngoc, 2016)	RCT (6 months)	TAU + family schizophrenia psychoeducation program (n = 30) TAU: Antipsychotic medication (n = 29)	Patient quality of life (QOL) Medication non-compliance (Medication compliance inventory)	Patient quality of life: F: 4.32, p < 0.05 Intervention $\Delta \bar{x}$: 0.26 Comparator $\Delta \bar{x}$: 0.06 Medication non-compliance ^a : F: 7.65, p < 0.01 Intervention: 0.29 Comparator: 0.59	ANCOVA ^a Higher score indicates higher non-compliance.	2
Study in Yogyakarta (Marchira, 2017)	RCT (6 months)	Brief psychoeducation program concerning schizophrenia (n = 50 patients and their family members) TAU: Standard family education (n = 50 patients and their family members)	Psychotic symptoms (Brief psychiatric rating scale) Psychotic symptoms (PANSS) Relapse/rehospitalization (Compliance and relapse assessment) Compliance	Psychotic symptoms (BPRS): t: 2.064, p: 0.042 Intervention $\Delta \bar{x}$: -35.52 Comparator $\Delta \bar{x}$: -38.04 Psychotic symptoms (PANSS): t: 1.129, p: 0.262 Intervention $\Delta \bar{x}$: -35.56 Comparator $\Delta \bar{x}$: -36.92 Relapse/rehospitalization: χ^2 : 2.367, p: 0.124 Intervention: 6% Comparator: 18% Compliance: χ^2 : 28.41, p: 0.0001 Intervention: 66% Comparator: 12%	Chi square test Independent sample t-test	3
Study in Shanghai (Cai, 2015)	RCT (18 months)	TAU + family therapy focused on cognitive rehabilitation (social skills individualised training and family psychoeducation) (n = 133) TAU: Antipsychotic medication (n = 123)	Psychotic symptoms (PANSS) Positive symptoms (PANSS) Negative symptoms (PANSS) G. psychopathology (PANSS)	Psychotic symptoms: F: 3, p: 0.08 Intervention $\Delta \bar{x}$: -4.44 Comparator $\Delta \bar{x}$: -4.86 Positive symptoms: F: 1.59, p: 0.21 Intervention $\Delta \bar{x}$: -1.09 Comparator $\Delta \bar{x}$: -1.08 Negative symptoms: F: 1.10, p: 0.30 Intervention $\Delta \bar{x}$: -1.48 Comparator $\Delta \bar{x}$: -1.52 G. psychopathology: F: 3.71, p: 0.06 Intervention $\Delta \bar{x}$: -1.87 Comparator $\Delta \bar{x}$: -2.25	ANCOVA controlling for confounders	5

(Table 6 continues on next page)

FEP intervention (First author, year)	Study type (Duration)	Intervention (n) Comparator (n)	Outcomes* (Measurement)	Findings	Statistical analysis	QS
(Continued from previous page)						
Suzhou Guangji Hospital (Zhang, 1994)	RCT (18 months)	TAU + Family intervention (group and individual counselling sessions) (n = 42) TAU: Antipsychotic medication (n = 41)	Hospital readmission Hospital-free period in readmitted patients Psychotic symptoms (Brief psychiatric rating scale) Functioning (Global assessment scale)	Hospital readmission: RR: 3.5 (95% CI: 1.6–7.6) $\chi^2 = 12.75$, $p < 0.01$ Intervention: 15.4% Comparator: 53.8% Hospital-free period in readmitted patients: $t: 2.9$, $p < 0.01$ Intervention: 245 days, sd: 104 Comparator: 130 days, sd: 79 Psychotic symptoms: $t: 0.67$, $p > 0.05$ Intervention $\Delta \bar{x}$: -17.3 Comparator $\Delta \bar{x}$: -17.0 Functioning: $t: 1.08$, $p > 0.05$ Intervention $\Delta \bar{x}$: 29.9 Comparator $\Delta \bar{x}$: 30.4	The statistical analysis for these findings is not provided.	3
Additional components (n = 3)						
Non-CBT psychotherapy						
Bolu Community Mental Health Center (Sukru, 2018)	Non-randomised controlled Study (6 months)	Antipsychotic medication + Interpersonal psychotherapy group (n = 20) Antipsychotic medication + Painting group (n = 20) Antipsychotic medication + Waiting list group (n = 20)	Functionality (Brief functioning assessment scale) ^a Psychotic symptoms (PANSS)	Functionality: ($p < 0.001$) Psychotherapy group $\Delta \bar{x}$: -23.3 Painting group $\Delta \bar{x}$: -4.6 Waiting list $\Delta \bar{x}$: -3.9 Psychotic symptoms: $p < 0.001$ Psychotherapy group ΔM : -8.5 Painting group ΔM : 0 Waiting list ΔM : 2.5	General linear model repeated ANOVA ^a The lower the score, the higher the functionality.	3
Cognitive training						
NIMHANS in Bangalore ² (Hedge, 2012)	RCT (2 months)	TAU + cognitive training (n = 22 patients and their family members) TAU: Antipsychotic medication + psychoeducation (n = 23 patients and their family members)	Psychotic symptoms (PANSS) Functionality (WHODAS-II)	Psychotic symptoms and functioning: ns	ANCOVA (Group $\times$ treatment interaction) controlling for confounders.	1
Electroconvulsive therapy						
Medical College in Nepal (Adhikari, 2014)	Cohort (12 months)	Electroconvulsive therapy + Antipsychotic medication (n = 12) Antipsychotic medication (n = 33)	Psychotic symptoms (Brief psychiatric rating scale) Functionality (Global assessment of functioning scale)	Psychotic symptoms: $p: 0.001$ Intervention $\Delta \bar{x}$: -61.9 Comparator $\Delta \bar{x}$: -53.3 Functionality: $p: 0.003$ Intervention $\Delta \bar{x}$: 76.0 Comparator $\Delta \bar{x}$: 61.8	Statistical analysis does not specify a statistical test performed to evaluate outcomes.	3
EIP: Early intervention in psychosis, FEP: First-episode psychosis, LMIC: Low- and middle-income country, N: National, I: Institute, NIMHANS: National Institute of Mental Health and Neuroscience, RCT: Randomised controlled trial, CBT: Cognitive-behavioural therapy, TAU: Treatment as usual, G: General, ns: not statistically significant, RR: Risk ratio, CI: Confidence interval, QS: Quality Score using the Mixed Methods Appraisal tool (Range:1–5, lowest to highest). PANSS: Positive and negative syndrome scale, PSYRATS: Psychotic symptoms rating scales, SLOF: Specific level of functioning scale, QOL: Quality of Life Enjoyment and Satisfaction Questionnaire, WHODAS-II: World Health Organisation Disability Assessment Schedule, second version. sd: standard deviation. $\Delta \bar{x}$: Difference between mean values at endpoint and baseline. ΔM : Difference between median values at endpoint and baseline. Negative values represent improvements for psychotic (positive, negative and general psychopathology symptoms) and depressive symptoms. Positive values represent improvements in functioning and quality of life. * $p < 0.05$ was considered statistically significant as per threshold for significance adopted by included studies. Outcomes in bold indicate no statistically significant difference.						

Table 6: Effectiveness of single-EIP components for individuals with FEP in LMICs.

components.^{12,80} All reviewed programmes offered additional components such as cognitive training, painting, non-CBT psychotherapy, occupational therapy and yoga. Some reflected local practices (e.g., yoga in India's SCARF programme⁸¹); others lacked a clear rationale.

Our decision to include FEP studies proved valuable because few effectiveness studies had been conducted within FEP programmes (5/27 records). Trials from Mexico and China and economic studies from China and Brazil showed that integrated treatment outperformed

antipsychotics alone across outcomes and was cost-effective,^{34,36} consistent with findings from HICs. A small Iranian trial found no differences, likely due to small sample size ($N = 20$).³⁵ Similarly to HIC evidence,^{82,83} our findings point to the benefits of CBT, patient psychoeducation, and family intervention for FEP in LMICs. While few HIC studies report on electroconvulsive therapy, evidence from LMICs suggests that it may improve outcomes.³⁹ Our findings highlight the need to define core integrated treatment components for FEP in LMICs, while adapting to local preferences and resources.

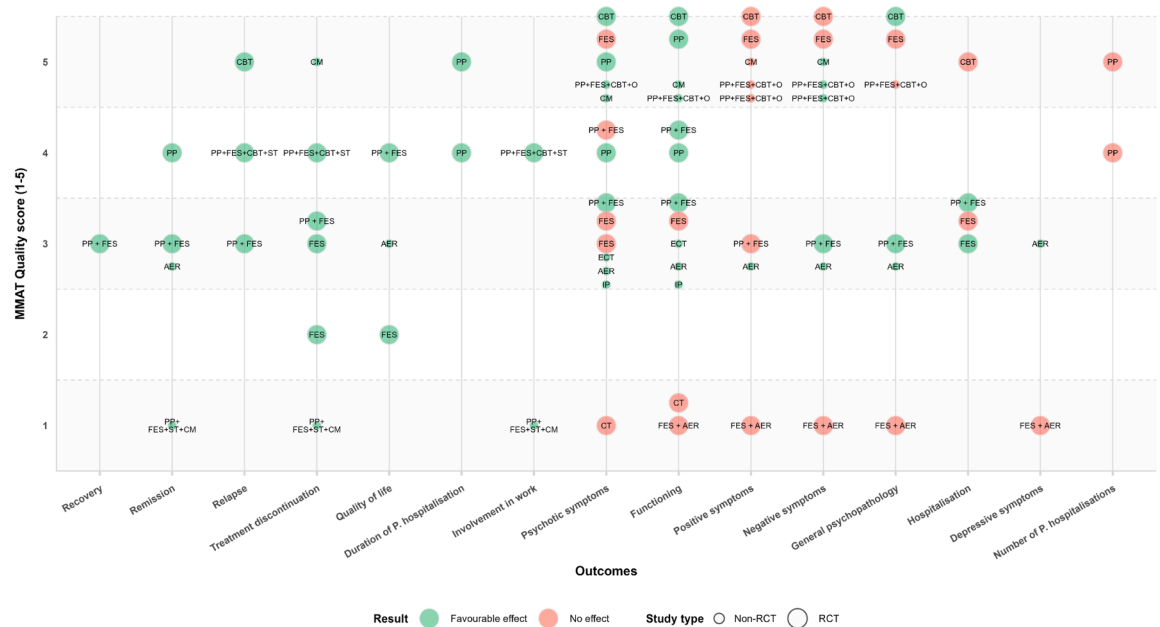


Fig. 3: Summary of outcomes and methodological quality of EIP for FEP in LMICs. Only psychological and psychosocial components of each intervention are represented as bubbles. Comparators in RCTs did not include such components; non-RCTs may or may not have comparators. The y-axis shows the quality score using the Mixed Methods Appraisal Tool (MMAT; Range:1–5, lowest to highest). Outcomes are arranged as positive, mixed, and negative findings. Bubble colour indicates the direction of results (green: favourable effect; red: no effect), and bubble size denotes study design (larger: RCT; smaller: non-RCT). EIP: Early intervention in psychosis, FEP: First-episode psychosis, LMIC: Low-and middle-income country, PP: Patient psychoeducation, FES: Family education and support, AER: Active engagement and retention, ST: Skill training, CM: Case management, CBT: Cognitive behavioural therapy; O: other components, ECT: Electroconvulsive therapy; IP: Interpersonal psychotherapy, CT: Cognitive training, P: Psychiatric. Treatment discontinuation was one of the most consistently desirably impacted outcomes. Positive effects also emerged for recovery, remission, quality of life, involvement in work, and duration of psychiatric hospitalisation, although from fewer studies with moderate to high methodological quality. In contrast, the outcomes most frequently assessed—psychotic, positive, negative, and general psychopathology symptoms, as well as functioning—showed a more heterogeneous pattern. Interventions incorporating patient psychoeducation, family psychoeducation and support, CBT, and case management tended to cluster at higher methodological quality levels and were more consistently associated with beneficial effects. No benefits were observed in two lower-quality studies combining family education and support with active engagement and retention or cognitive training. Depressive symptoms and number of hospitalisations were each examined in only a few studies, and did not show any significant improvement.

Like FEP programmes, CHR services in LMICs struggled to deliver several guideline-based treatment components and sustain treatment. Only half (4/8) offered CBT, despite it being recommended to reduce conversion risk⁵—a gap reported globally.⁸⁴ Interventions to prevent functional deficits, a key predictor of conversion and disability,⁸⁵ were provided by just two programmes. Of the six programmes reporting duration, only three met the recommended three-year follow-up; the rest offered shorter monitoring, potentially missing cases who convert to psychosis later.⁸⁶ This limitation has also been noted of CHR programmes in HICs.⁸⁴ Additional components included antipsychotics and omega-3 fatty acids, both controversial, as the former could increase the likelihood of conversion to psychosis,⁸⁷ while the latter has mixed efficacy evidence.^{5,88}

Effectiveness evidence for CHR was scarce—only six records were identified, none assessing integrated

treatment and only three examining conversion to psychosis. This reflects the challenges of conducting intervention studies on CHR in LMICs including limited funding, insufficient community involvement, and cultural obstacles, necessitating context-sensitive approaches to CHR research as suggested by LMIC researchers.²⁵

HIC guidelines recommend multicomponent care for early psychosis.⁸ In LMICs, however, while second-generation antipsychotics are widely used, psychological and psychosocial components remain inconsistently offered, even within formal EIP programmes. This reflects systemic constraints, including workforce shortages, inadequate infrastructure, and limited budgets,¹¹ suggesting that the strict replication of HIC models may be unrealistic. Instead, LMICs may need to adapt approaches like task-sharing, task-shifting, and mobile health, which have demonstrated benefits in other health areas in resource-limited settings.^{89,90} This may

help improve access to evidence-informed psychological and psychosocial treatments.

Furthermore, most of the research we reviewed focused on evaluating patient outcomes of interventions in tertiary care, with few studies addressing implementation outcomes, scale-up pathways, and integration into primary care systems.⁹¹ Future research should also prioritise expanding EIP's reach by integrating services into existing health systems and ensuring cultural appropriateness. Our review identified gaps in the implementation of the World Psychiatric Association's Expert International Advisory Panel's recommendations for EIP in LMICs.^{92,93} Only one programme (Russia) had national integration and public health activities.³³ Only two (Brazil and India) reported cultural adaptation.^{28,53} Few used shared care or community engagement to facilitate help-seeking,³² or provided workforce training.¹⁵ Telepsychiatry and digital approaches were rare, limited to teleconsultation in Brazil,²⁹ and a hotline in Malawi,³² as were coordinated networks such as Latin America's Andes Network.⁹⁴ Co-design, mental health awareness initiatives, and outreach to vulnerable populations (e.g., homeless, Indigenous) were notably absent. To improve translation into policy and practice, implementation should be guided by measurable indicators, such as coverage, fidelity, local interventions and workforce training, embedded within systematic monitoring frameworks (e.g., WHO Mental Health Atlas) that enable comparison, accountability and continuous improvement across health systems.⁹⁵

For CHR, limited evidence, low conversion rates,⁸⁶ and recruitment and retention challenges raise concerns about feasibility and sustainability.²⁵ Similar debates exist in HICs, including that individuals accessing these programmes do not represent the broader CHR population.⁹⁶ Recognition that psychosis can emerge from mood, anxiety, or other syndromes has led to transdiagnostic youth mental health services.^{97,98} Such models may be more appropriate in LMICs, yet our review found no such programmes.

In terms of limitations, this review only included database-indexed records. Although we searched additional databases and contacted researchers, we did not search grey literature. We could review only as much detail on treatment components as was provided by authors, which was often scarce. Records from the same intervention were grouped, but some provided distinct data (e.g., different age limits); in such cases, all data were reported. Country income classifications may have changed since our search, but such shifts do not impact the health sector immediately and are therefore unlikely to affect our findings. Effect sizes could not be reported or pooled due to incomplete and/or heterogeneous data. Consequently, this review systematically summarised the available evidence on outcomes reported across diverse EIP programmes and studies in

LMICs. This allowed us to identify which strategies are effective for each outcome and the quality of the evidence supporting these findings. In some cases, initiatives combined clinical and research activities,⁹⁹ making the distinction between programmes and studies not straightforward. These were categorised as programmes due to their specialisation and sustained duration over time. Finally, most included records did not report information on participants' race and ethnicity, precluding the systematic analysis of these variables.

Some records were excluded for not describing treatment components or following up participants. These include FEP studies in Jordan,¹⁰⁰ Malaysia,¹⁰¹ Mauritius,¹⁰² Morocco,¹⁰³ Sri Lanka,¹⁰⁴ Suriname,¹⁰⁵ Iran,¹⁰⁶ Nigeria; and Trinidad and Tobago,¹⁰⁷ and CHR studies in Kenya.¹⁰⁸ We also identified promising ongoing projects, including psychoeducation in Uganda,¹⁰⁹ and in Pakistan, culturally adapted CBT and family intervention,¹¹⁰ and collaboration between traditional healers and clinicians.¹¹¹ The limited representation of LMICs in this review is likely indicative not only of an absence of EIP programmes/studies but also reporting and publication gaps.

This review's strengths include the classification of interventions by delivery context (programmes vs. studies). This avoided mislabelling short-term research as programmes. We classified components as guideline-based or additional, allowing both the assessment of guidelines' implementation and the documentation of innovative/culturally adapted strategies. We contacted many authors to clarify data, ensuring accuracy. Our review included all eligible records regardless of language, covering English, French, Spanish, Portuguese, Turkish, and Persian, thereby enhancing the breadth and diversity of the evidence.

Few LMICs have FEP programmes and studies and even fewer target CHR. Guideline-based psychological and psychosocial components are seldom implemented, reflecting systemic resource constraints. Still, evidence from LMICs clearly shows that multicomponent care can improve recovery and quality of life for people with FEP. However, large-scale implementation and population-level impacts (e.g., coverage, mortality) remain underexplored. Innovative delivery methods may help expand access to early psychosis care, particularly its psychological and psychosocial components, in LMICs.

Contributors

RV formulated the project, developed the protocol, conducted data collection, performed the analyses, interpreted the results, and drafted the manuscript. NM participated in data collection, contributed to the analyses, and assisted in drafting the initial version of the manuscript. VR contributed to methodology development, supported the analyses, and provided critical feedback on the manuscript. SNI conceptualised the project, contributed to methodology development, oversaw the analyses, and provided substantive feedback that strengthened the manuscript. All authors read and approved the final version of the

manuscript. RV, NM, and SNI accessed and verified the underlying data.

Data sharing statement

All data used in this study are publicly available from previously published literature. Most of the data and analyses supporting this systematic review are provided in the [Supplementary Material](#). The study protocol has been registered and published in the International Prospective Register of Systematic Reviews (PROSPERO) under the identifier CRD42022308467. The reporting of this review followed the PRISMA guidelines (Table S16).

Editor note

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Declaration of interests

We declare no competing interests.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.eclinm.2026.103795>.

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