Innovations in community-based mental health care: an overview of meta-analyses

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Abstract

In the last four decades, mental health services for people with Severe Mental Illness (SMI) have seen asylums replaced by a balanced model of Community Mental Healthcare (CMH). Innovative approaches and strategies in the field of CMH have been extensively researched. However, this research has been hampered by issues limiting their capacity to inform clinicians and policymakers. We conducted an overview of meta-analyses of the effectiveness of innovative CMH models focusing on clinical and psychosocial outcomes in comparisons with standard care in adults with SMI. Based on the 12 eligible studies, we appraised, synthesized and graded the resulting evidence. There was moderate quality evidence that case management, Early Intervention Services (EIS) and caregiver-directed interventions were superior to standard care in reducing hospital admission. In relation to psychosocial outcomes, EIS showed high quality evidence of a small effect on global functioning. There was moderate quality evidence for a similar effect of Intensive Case Management, and for a large effect of family intervention. For quality of life, both EIS and self-management education had a small effect, with moderate quality. The level of research about effective CMH models is therefore substantial. However, several gaps related to innovative CMH not yet covered in meta-analytic synthesis, need to be filled.

Keywords: community mental health; innovation; meta-analyses overview; severe mental illness.

1. Introduction

Severe Mental Illnesses (SMIs) are among leading health causes of disability worldwide, with globally high social costs, accounting for the vast majority of the economic burden attributable to non-communicable diseases (WHO, 2021). In most low-, medium- and high-income countries in the last four decades, the history of mental health services addressing the care needs of people with SMIs has reflected the decline of the asylum, variably replaced by a balanced care model (Thornicroft & Tansella, 2013). This approach to mental healthcare delivery assumes that an appropriate mix, across a wide range of local community settings, including long-term residential and hospital-based services providing acute inpatient treatment (Thornicroft & Tansella, 2002), represents the best solution for the mental health care needs of people with SMI. However, despite its diffusion across national health care delivery systems, there has been surprisingly little definition or discussion of the role, function and design of its critical and innovative components. Most relevant research has focused rather on specific clinically relevant questions, taking for granted, at least in terms of compliance to human rights, that community models inherently produce good practices for people with SMI (WHO, 2021). CMH development has been strictly influenced and guided by principles and evidence from social psychiatry (Bughra & Morgan, 2010), balancing the dominant biomedical model and its limited interest in exploring innovative models of care as opposed to treatment (Deacon, 2013). Although principles and values such as moral relevance and social influence (Pilgrim & Rogers, 2005) are fundamental to developing adequate CMH services, the relevant design and development must be rooted in interventions and service models with robust evidence in order to preserve social psychiatry from the tides of ideology (Bebbington, 1992). However, the practical and ethical challenges in allocating participants from CMH services to experimental studies have hampered research in this field, so that the evidence base is far from sufficient (Wykes et al., 2021). In consequence, national health policies have often augmented approaches and models based on research of reasonable quality with others that at best require further evaluation. It may be true that complex healthcare ecosystem approaches to CMH are

nonlinear and uncertain, as well as context- and time-dependent, and they should therefore follow "*evidence-informed*" rather than "*evidence-based*" guidance, and that policymaking is an inherently political practice, in which research evidence is only one of the factors involved (Rosen et al., 2020).Nonetheless, across the last three decades, significant evidence has been produced about innovative approaches and strategies in the field of CMH, including a number of systematic reviews with meta-analytic syntheses of the accumulated evidence. However, also these are hampered by issues limiting their informative potential. First, as they focus on specific CMH interventions with very different targeting (ranging from peer support strategies, to supported employment and intensive care management), their likely informative impact is inevitably variable, not to mention the effect of local comparisons with widely differing standard quality of care (Dieterich et al., 2017; Fuhr et al., 2014; Kinoshita et al., 2013). In addition, outcomes chosen for much of this research are understandably consistent with the specific domains they aim at changing or improving. The consequence has been a heterogeneity of findings in several areas, with difficulties in synthesizing the evidence and few attempts to assess different CMH interventions in relation to selected, standardized outcomes (Raviola et al., 2019). This has inevitably led to difficulties in distinguishing the relative contribution of the specific interventions, making it hard for clinicians and policymakers to decide which CMH innovations should be prioritized in their local context (Castillo et al., 2019). Furthermore, there remains some lack of clarity about what exactly an innovative model of CMH is, as compared with interventions that more specifically target the individual (Leichsenring et al., 2022). These problems with nomenclature are comprehensible but challenging, and this is reflected also in the available meta-analytic literature. For example, while self-management empowering individuals with SMI in their recovery is an individual-oriented component that may easily be introduced into standard community care (Lean et al., 2019), the provision of early intervention for recent onset psychosis may require radical redesign at least in terms of local configuration and staffing of mental health care delivery (Puntis et al., 2020). Despite the shared innovative nature, their significant difference in scope is clear. Finally, while it is certainly appropriate to address

novel needs of some special populations (e.g., refugees and asylum seekers; elderly; adolescents; ethnic minorities; people with comorbid drug and alcohol misuse; prisoners), several meta-analyses have focused on specific considerations that are hardly useful for assessing and re-designing mainstream CMH services (e.g., Uphoff et al., 2020). Similarly, CMH models purposely implemented within low- and middle-income countries settings (e.g., Asher et al., 2017) may be less relevant in western health systems, where standard services are likely to provide relatively high-quality standard treatments and outcomes, making comparisons inappropriate at best.

With a view to remedying these limitations and gaps in the literature, we conducted an overview of relevant meta-analyses testing innovative CMH interventions. Evidence from meta-analytic synthesis can indeed provide a rigorous and transparent knowledge base for translating research into clinical practice (Fusar-Poli & Radua, 2018). This work was thus aimed at (i) providing core definitions of the different, innovative CMH interventions for adult people with SMI, thereby allowing more systematic comparison with standard care in terms of effectiveness, and (ii) testing these models on a key set of generalizable enough clinical and psychosocial outcomes, namely hospital admission, global functioning, and quality of life (QoL).

2. Methods

We carried out an overview of meta-analyses of CMH interventions for SMI, following a structured plan aimed at summarizing available evidence (Pollock et al., 2022). We defined relevant eligibility criteria and performed a comprehensive systematic search of multiple databases. We then synthesized CMH interventions findings according to specific clinical and psychosocial outcomes, as reported within the meta-analyses included. Finally, from the available information we assessed the certainty of evidence of any CMH intervention for each considered outcome. No ethical approvals were sought for this secondary analysis of previously published data.

2.1 Eligibility criteria

We included meta-analyses testing innovative CMH interventions for adults (18-65) suffering from SMI (e.g., Carrà et al., 2011) as compared with standard care. We defined CMH interventions as those promoting mental health of adult people with SMI living in the community, through a network of accessible and acceptable supports, services and resources of adequate capacity aimed at addressing their care needs (Thornicroft et al., 2016). In order to improve consistency and comparability of data, we excluded: i) meta-analyses on specific psychological treatments only delivered opportunistically in community settings; ii) meta-analyses focusing on special populations, e.g., asylum seekers and elderly people; iii) meta-analyses including primary prevention interventions; iv) meta-analyses dealing with CMH models purposely implemented for low and middle income countries; v) non-systematic pooled analyses; vi) studies that did not report on relevant clinical and psychosocial outcomes. In order to increase the comparability between studies, we included only quantitative syntheses on selected outcomes, without considering systematic reviews not providing meta-analytic data. In case of overlapping data from meta-analyses investigating similar interventions and outcomes, we selected the research including the largest number of studies or the most comprehensive findings. Grey literature, conference abstracts, and publications that had not undergone peer-review were excluded.

2.2 Outcomes choice and definitions

In order to reduce the effects of the heterogeneity in content, target domains and outcomes chosen by the various meta-analyses on the CMH model proposed, we focused on key outcomes, attempting to infer basic but valid information that would allow us to estimate actual effects of the single interventions in comparison to standard care. As the core clinical outcome, we thus chose hospital admission, given it is a sufficiently generalizable measure largely independent of local resources and circumstances. In addition, global functioning and quality of life (QoL) were considered appropriate psychosocial outcomes, regardless of the relative variety of measures used. Finally, we appraised all outcomes at the endpoints considered in the relevant meta-analyses,

extracting them as available, with the aim of assessing any methodological heterogeneity in relation to duration and follow-up across the included studies.

2.3 Search strategy and study selection

A systematic literature search for meta-analyses on CMH interventions was conducted on Ovid MEDLINE, Embase, and APA PsycInfo electronic databases (via Ovid), as well as on the Cochrane Database of Systematic Reviews (CDSR), on March 3, 2022. We used the following search phrase: (community mental health or community based mental health) and (systematic review* or meta analys*).mp, with '.mp' code meaning that it included title, abstract, heading words, and keywords. No language restrictions were applied. After a preliminary screening based on titles and abstracts, full texts were retrieved to evaluate eligibility. Studies were independently screened and read in full text by four authors (CAC, RMC, FM, SP), and any potential disagreement was resolved by discussion between all the authors.

2.4 Data extraction

Four authors (CAC, RMC, FM, SP) independently extracted data and blindly cross-checked them for accuracy. A data extraction template was used to collect key information from the eligible meta-analyses, including: author(s) and year of publication; investigated CMH intervention(s); target population; number of included studies (k); total sample size (N) and number of subjects allocated to the index intervention and to standard care; measures of the effects (Odds Ratio - OR; Risk Ratio - RR; Standardized Mean Difference - SMD) with their 95% confidence intervals (95%CIs), p-values, and heterogeneity measures (I^2 statistic values).

2.5 Data interpretation and quality assessment

The magnitude of the effect of CMH interventions for the selected outcomes was evaluated in relation to conventional cut-offs (0.2 small, 0.5 medium, 0.8 large, 1.3 very large) (Rosenthal,

1996). In order to evaluate the effect magnitude for ORs/RRs, these were converted into effect sizes, following standard formulae (Borenstein et al., 2009; Grant, 2014; Sànchez-Meca et al., 2003). The level of statistical significance was set at $p<0.05$.

For each significant outcome, we critically appraised the quality of evidence for the various CMH interventions from the single relevant meta-analyses, classifying it as high, moderate, low, or very low, following the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (Guyatt et al., 2008; Schünemann et al., 2021). Considering meta-analyses as the primary unit (Pollock et al., 2022), evidence quality was evaluated, and rated down if appropriate, according to the following items: risk of bias, precision of effect, consistency of findings, indirectness, and publication bias (Schünemann et al., 2021).

We first evaluated the quality of studies included in the single meta-analyses, downgrading the evidence by one level if an overall potential risk was reported, in terms of selection, information, or reporting biases. We next evaluated precision, rating down the quality of evidence by one level if the 95% CI width of the effect size was over 0.4. In addition, consistency was assessed by verifying the I^2 value, downgrading by one level the quality of evidence if the I^2 was ≥75%. We also assessed potential sources of indirectness, downgrading the quality of evidence by one level if populations, interventions, comparators (standard care), and outcomes were somehow different from those of interest. Finally, where appropriate, we evaluated the risk of publication bias, downgrading the quality of evidence if funnel plots and Egger's test showed asymmetry or the systematic search of studies was not sufficiently comprehensive, i.e., less than three databases were used. The quality was assessed independently by five authors (FB, CAC, RMC, FM, SP) and any disagreement was resolved by discussion with all authors.

3. Results

3.1 Search results

Our systematic search generated 692 records via Ovid (256 from Ovid MEDLINE, 223 from Embase, and 213 from APA PsycInfo), reduced to 446 unique articles after deduplication. In addition, 125 records were retrieved from the Cochrane Database of Systematic Reviews. The preliminary screening by titles and abstracts identified 123 potentially eligible studies. We manually searched the reference lists of these studies, thereby identifying 25 additional papers. After the full-text review, 12 out of 148 studies met the eligibility criteria and were included (Ashcroft et al., 2018; Correll et al., 2018; Dieterich et al., 2017; Farrelly et al., 2013; Fuhr et al., 2014; Ibrahim et al., 2014; Kinoshita et al., 2013; Kisely et al., 2017; Lean et al., 2019; Malone et al., 2007; Pharoah et al., 2010; Zhao et al., 2015). The study selection process is fully described in **Figure 1**.

Figure 1 about here

3.2 Characteristics of the included meta-analyses

All the included studies were in English language, and the time span ranged from 2007 (Malone et al., 2007) to 2019 (Lean et al., 2019). The target clinical population was SMI for the majority of meta-analyses (Dieterich et al., 2017; Farrelly et al., 2013; Fuhr et al., 2014; Ibrahim et al., 2014; Kinoshita et al., 2013; Kisely et al., 2017; Lean et al., 2019; Malone et al., 2007; Zhao et al., 2015), whereas three specifically focused on individuals with schizophrenia-spectrum disorders (Ashcroft et al., 2018; Correll et al., 2018; Pharoah et al., 2010). A summary of main characteristics of the included meta-analyses is shown in **Table 1**.

Table 1 about here

3.3. CMH interventions

Our meta-analyses tested seven different general models of CMH interventions, with different degrees of innovation and impact in terms of needs for reconfiguration, and in comparison with standard CMH. Based on the general criterion in terms of additional resources required, we provide relevant core definitions, listing studies which dealt with single models. The number of included RCTs for each meta-analysis lay between two (Kisely et al., 2017) and 53 (Pharoah et al., 2010). The number of included subjects for each meta-analysis ranged from 90 (Pharoah et al., 2010) to 5790 (Lean et al., 2019) (**Table 2**).

Case Management (CM), Assertive Community Treatment (ACT) and Intensive Case Management (ICM) (n=2: Dieterich et al., 2017; Malone et al., 2007). These are interconnected CMH models, based on the rationale of providing progressively more intensive and focused care to people with increasingly severe SMI living in the community. However, the shared components are likely to be the cause of difficulties in clearly distinguishing similarities and differences between them. In brief, CM refers to the coordination of mental health services where a person suffering from SMI is assigned a case manager who is expected to: (i) assess the person's needs; (ii) develop a care plan; (iii) arrange for suitable care to be provided; (iv) monitor the quality of the care; and (v) maintain contact with the person (Holloway, 1991). Case managers are not necessarily psychiatrists, and interventions are mainly provided by other regularly supervised health workers. ACT is a form of CM, involving a relatively small team, delivering interventions to a restricted number of reluctant or uncooperative to care clients, who do not require immediate admission. ICM explicitly sets the size of the caseload provided with high-intensity input (fewer than 20) (Scott & Dixon, 1995; Thornicroft, 1991).

Early intervention services (EIS) (n=1: Correll et al., 2018), are purposely intended to meet the care needs of people in the early stages of psychosis. These programs are delivered by multidisciplinary teams who provide tailored psychosocial and psychopharmacological interventions according to three different models: “stand-alone”, “hub and spoke” and integrated (Nordentoft et al., 2014).

These all prevent the referral of young people to other health care providers for any treatment need, including standard CMH (NHS England, 2016).

Caregiver-directed or Family intervention for schizophrenia (n=2: Ashcroft et al., 2018; Pharoah et al., 2010) include psychosocial interventions based on the active participation of one or more family members or caregivers, and involving education, support and management to reduce *expressed emotion* within families. They aim at building an alliance with relatives, providing psychoeducation, and mitigation of the effects of complex and tense domestic environments, as well as discussing reasonable expectations for client performance (Sin et al., 2017).

Compulsory Community Treatments (CCT) (n=1: Kisely et al., 2017) are used in many countries for the compulsory treatment of people with SMI, bringing stability in their lives, and obviating repeated hospital admissions. However, given their emphasis on power and threat, challenging the relationship with service users living in the community, it is essential to assess their real benefits for key outcomes (Pinfold et al., 2001).

Recovery (n=4: Farrelly et al., 2013; Ibrahim et al., 2014; Lean et al., 2019; Zhao et al., 2015) is a relatively recent paradigm, prioritizing adjustment to SMI and a shift towards individually-significant functional, existential and social purposes. Despite the wide variety of recovery-oriented interventions proposed, the core common components involve: 1) providing information and skills; 2) promoting a working alliance; 3) role modeling recovery; and 4) increasing choice (Winsper et al., 2020).

Peer Support (n=1: Fuhr et al., 2014) considered recovery-oriented intervention, is defined as a service delivered by a trained person with a personal experience of SMI to someone with a serious mental disorder, offering long-term support to make possible recovery in the community (Davidson et al., 2012; Davidson et al., 2006).

Supported employment (n=1: Kinoshita et al., 2013) involves specialist intensive and training support from job coaches to people with SMI in normal work settings (Bond et al., 2012; Bond et al., 1997). Although primarily focused on vocational outcomes, it is supposed to improve general clinical outcomes and QoL.

Detailed descriptions of CMH interventions included in single meta-analyses, with related follow-up, are reported in **Table S1**.

3.4 Synthesis of results and quality of evidence

3.4.1 Hospital admission

Nine meta-analyses, covering CM/ACT/ICM (n=2: Dieterich et al., 2017; Malone et al., 2007), EIS (n=1: Correll et al., 2018), caregiver-directed interventions (n=1: Ashcroft et al., 2018), CCT (n=1; Kisely et al., 2017), recovery-based approaches (n=3: Farrelly et al., 2013; Lean et al., 2019; Zhao et al., 2015), and supported employment (n=1: Kinoshita et al., 2013), provided data about effectiveness in relation to hospital admission for people with SMI. Statistically significant albeit small effects were reported for CM (Malone et al., 2007), EIS (Correll et al., 2018), caregiver-directed interventions (Ashcroft et al., 2018), and supported employment (Kinoshita et al., 2013), as compared with standard care (**Table 2**). The overall quality of evidence according to the GRADE items was moderate, apart from low quality evidence from the meta-analysis on supported employment (**Table S2**). No effects were estimated for other selected CMH interventions, including ICM (Dieterich et al., 2017), CCT (Kisely et al., 2017), and recovery-based approaches such as self-management education (Lean et al., 2019) user held records (Farrelly et al., 2013) and brief psychoeducation (Zhao et al., 2015) (**Table 2**).

3.4.2 Global Functioning

Eight meta-analyses addressed the effectiveness of CM/ACT/ICM (n=1: Dieterich et al., 2017), EIS (n=1: Correll et al., 2018), caregiver-directed interventions (n=1: Pharoah et al., 2010), recovery-

based approaches (n=3: Ibrahim et al., 2014; ; Lean et al., 2019; Zhao et al., 2015), peer support (n=1: Fuhr et al., 2014), and supported employment as compared with standard care (n=1: Kinoshita et al., 2013) provided data on global functioning in people with SMI. No effects were estimated for most of them (**Table 2**), including peer-support (Fuhr et al., 2014), the recovery-oriented strength-based (Ibrahim et al., 2014) and brief psychoeducation (Zhao et al., 2015) approaches, and for supported employment (Kinoshita et al., 2013). Nonetheless, significant effects on global functioning were reported for family interventions (large effect; Pharoah et al., 2010), and recovery-based, self-management education (medium effect; Lean et al., 2019), as well as for EIS (small effect; Correll et al., 2018) and ICM (small effect; Dieterich et al., 2017) (**Table 2**). The overall quality of evidence was deemed high for early interventions, and moderate for family interventions and ICM. It was very low for self-management education, given the imprecision and inconsistency of findings, as well as the possible risk of bias in the included studies (**Table S3**).

3.4.3 Quality of life

Seven meta-analyses tested the effectiveness on QoL of various CMH interventions, including CM/ACT/ICM (n=1: Dieterich et al., 2017), CCT (n=1: Kisely et al., 2017), EIS (n=1: Correll et al., 2018), recovery-based approaches (n=2: Ibrahim et al., 2014; Lean et al., 2019), peer support (n=1: Fuhr et al., 2014), and supported employment (n=1: Kinoshita et al., 2013).

Few CMH interventions showed benefit in terms of QoL improvements as compared with standard care: only EIS (Correll et al., 2018) and recovery-based, self-management education (Lean et al., 2019), both on the basis of small effects and moderate quality of evidence (**Table 2**; **Table S4**). No effects were reported for ICM (Dieterich et al., 2017), peer-support (Fuhr et al., 2014), strength-based approaches (Ibrahim et al., 2014), supported employment (Kinoshita et al., 2013) or CCT (Kisely et al., 2017) (**Table 2**).

Table 2 about here

4. Discussion

4.1 Summary of findings

In this meta-review, based on 12 eligible studies, we appraised, synthesized, and graded the available evidence from meta-analyses of RCTs examining the effectiveness of several innovative models of CMH in comparison with standard care. To our knowledge, this is the first comprehensive attempt to produce such an overview. It enabled us to summarize a large volume of findings and to make a careful judgment on innovative forms of CMH, based on a balanced evaluation of the effect sizes, the quality of evidence, and the relevance of the outcomes chosen.

In relation to the core clinical outcome of hospital admission, case management delivered by community mental health teams, EIS and caregiver-directed interventions all provided evidence of moderate quality in terms of superiority to standard care, albeit with small effects, whilst supported employment had a similar effect size, but based on low quality evidence.

Finally, assessing effectiveness in terms of significantly improved psychosocial outcomes, our findings were quite mixed for global functioning, with EIS showing a small effect but supported by a high quality of evidence, whereas ICM also had a small effect but with only moderate quality evidence; the reported effect for family interventions was large, but based on poor evidence. Although recovery-based self-management education apparently had a medium effect, this was based on low quality evidence. Finally, there was moderate quality evidence that both EIS and self-management education had definite but small effects on QoL

4.2 Implications for policy and practice

Based on its comprehensiveness, our study provides several important indications offering guidance for rational treatment choices based on specific local objectives and possibilities. When assessing, planning and designing new CMH models, mental health authorities should consult widely, starting from the considerable accessible evidence base for community mental health services (Rosen et al., 2020).

The case management approach, including the specialist and tailored form for young people represented by EIS, seems reasonably effective, with acceptable evidence for reducing risk of hospital admission, clearly a meaningful objective for social and community psychiatry. Components likely to explain this include: participation of case managers in delivering services in the community, with a focus on building natural connections and on self-determination; a team approach with small enough caseloads and non-time-limited crises response; and access to quality supervision (Rapp & Goscha, 2004). It is now also clear that caregiver-directed interventions can, along with emotional burden (Carrà et al., 2012), reduce hospital admission to some extent, particularly cost-effective when redesigning CMH services for both early and later psychosis (Carrà et al., 2007; Onwumere et al., 2011).

However, psychosocial outcomes may well be seen more consistent with a community approach to mental health care. Thus it is of particular interest that, as well as EIS, ICM and family interventions show good evidence of their role in ameliorating global functioning of people with SMI. Similarly, QoL appears to benefit from both EIS and recovery-oriented self-management education.

Nevertheless, it is worth mentioning that comparable improvements on these outcomes seem attributable both to radical redesigning approaches, as required by EIS and ICM, and to apparently minor and to more easily implemented innovations like family- and recovery-oriented interventions (Killaspy et al., 2022). This is certainly challenging for clinicians and policymakers, who have to balance the costs and benefits of new service- level interventions fostered by specific policy and government investment, with other effective options, such as family interventions, which would probably demand nothing more than implementation efforts and costs. However, in terms of cultural barriers, a major caveat for some of these individual-level interventions with an established evidence base, relates to their generalizability, which may hinder their successful adaptation and implementation in new contexts (Moore et al., 2021). For example, efforts have been made to adapt recovery-oriented interventions in non-western settings (e.g., Daass-Iraqi et al, 2021; Goodman-

Casanova et al., 2022). However, communication codes, local rules and traditions, social structure, religious beliefs, and explanatory models of mental health and illness (Slade et al., 2012), may all compromise the accessibility and effectiveness of these approaches.

4.3 Implications for research

A major issue, which emerged clearly from our findings, is the wide heterogeneity in durations of follow-up in the various studies of CMH interventions included in the meta-analyses we considered. The longitudinal dimension is certainly among the main drivers for clinicians and policymakers when choosing cost-effective innovations in mental health care delivery. Unfortunately, the available literature remains limited in this respect, with poor comparable information. This makes it difficult to deliver recommendations favoring multi-level stakeholder commitment and investment towards specific implementations (Rosen et al., 2020). Better standardization in the design characteristics and measures of studies assessing different CMH approaches (including key-components appraised for their fidelity, standard primary endpoints, duration of intervention and follow-up) is needed to advance the evidence base (Essock et al., 2015). Similarly, consensus is needed on nomenclature and a shared classification of the different CMH models and components, along with a disentangling of nosological ambiguities in terms of the classification of participants.

4.4. Limitations

The findings of this meta-review must be interpreted in the light of particular limitations. First, several factors mitigated the quality of evidence, preventing firm conclusions about many of the investigated approaches. Secondly, the overall confidence in the results of the meta-analyses is moderate at best, primarily because some did not adequately assess or discuss the risk of bias in the original RCTs. Third, the included studies provided very variable follow-up periods (from six weeks to three years), precluding definitive information on estimates of duration of efficacy. Furthermore, the nature of our overview of meta-analyses does not allow inferences concerning the

comparative effectiveness of the different interventions addressed. Meta-reviews are limited by methodological variability across the included meta-analyses and informal indirect comparisons are inappropriate (Ioannidis, 2009; Pollock et al., 2022).

In addition, most of the studies included in the meta-analyses identified were conducted in high-income countries, limiting generalizability to other contexts. More importantly several innovative CMH interventions, both at individual- and organizational- level (e.g., crisis resolution teams, social skills training, housing and supported accommodation) have insufficient numbers of RCTs to support meta-analysis, precluding their inclusion in our overview regardless of their potential effectiveness. Because of this, a full assessment of additional RCTs on the most promising approaches not covered in meta-analytic syntheses may be an important target for future research, including interventions with recognized evidence of effectiveness in the general population, but which may also be beneficial for people with SMI.

5. Conclusion

Our overview of meta-analyses reveals encouraging levels of research on effective CMH models, as well as several indications for future research in this field. A call has been made for psychiatrists, researchers, policymakers, people living with SMI, and other relevant stakeholders to improve the efficacy, efficiency, and adequacy of CMH interventions in different international contexts (Ruggeri et al., 2008). This is a challenging but unavoidable task preliminary to the identification of policy gaps, preceding the introduction of increased resources and newly designed CMH services (DeSilva et al., 2014).

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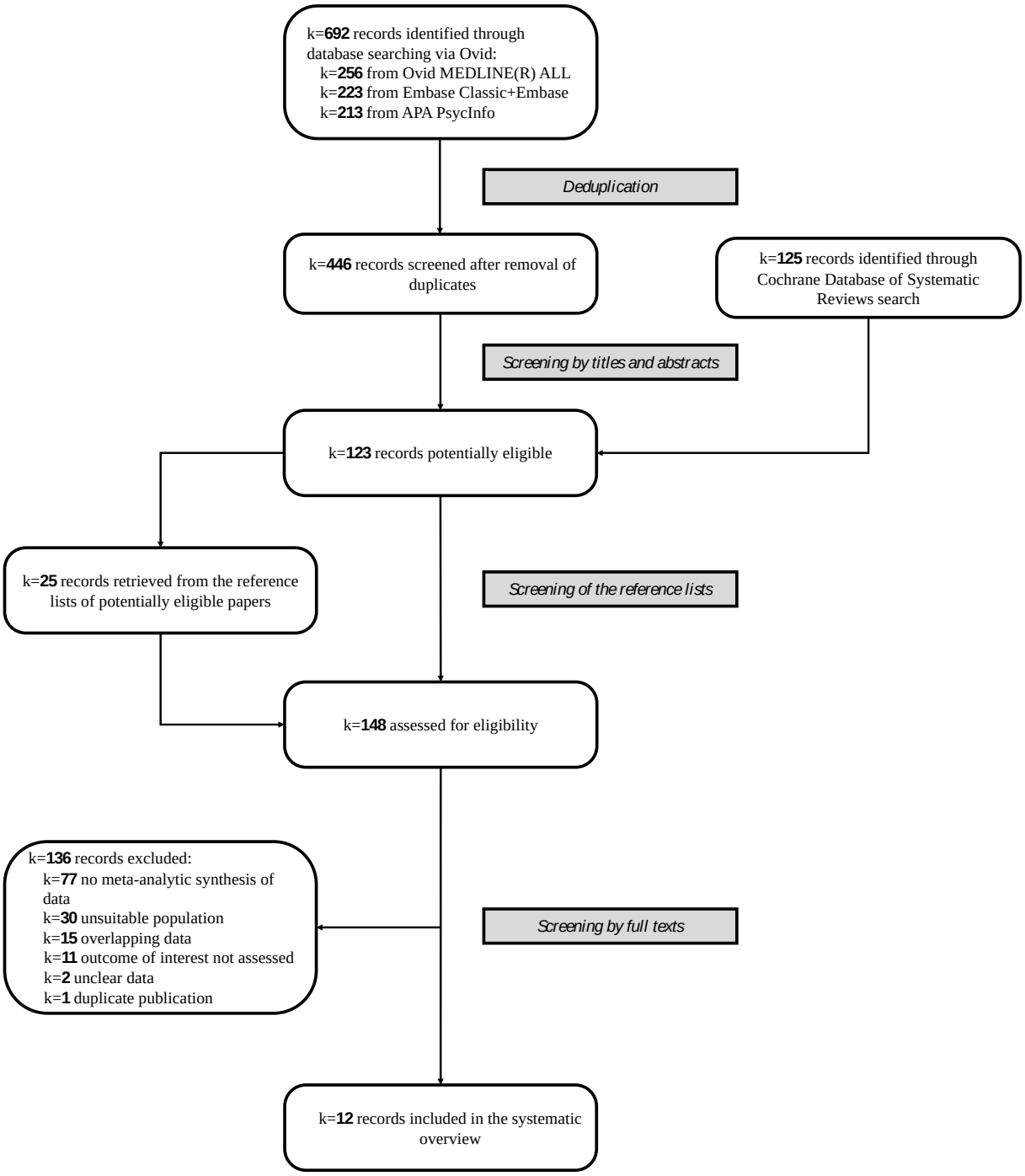
Figure 1. Flowchart of the inclusion process.



k = number of records.

Table 1. Characteristics of the included meta-analyses.

Author(s), year	*Country*	*Category*	*Intervention*	*k*	*N*	*Population*	*Setting*
Ashcroft et al., 2018	UK	CIs	Caregiver intervention	18	3418	SSDs	Global
Correll et al., 2018	US	EISs	EISs	10	2176	SSDs	Global
Dieterich et al., 2017	UK	CM/ACT/ICM	ICM	29	N/R	SMI	High Income
Farrelly et al., 2013	UK	RAs	User–held records	4	607	SMI	High Income
Fuhr et al., 2014	UK	PS	Peer–delivered intervention	10	2714	SMI	High Income
Ibrahim et al., 2014	UK	RAs	Strengths–based approach	8	640	SMI	High Income
Kinoshita et al., 2013	JP	SE	SE	14	2265	SMI	Global
Kisely et al., 2017	AU	CCT	CCT	3	739	SMI	High Income
Lean et al., 2019	UK	RAs	Self–management education	35	5790	SMI	Global
Malone et al., 2007	UK	CM/ACT/ICM	CMH teams	3	587	SMI	High Income
Pharoah et al., 2010	UK	CIs	Family interventions	53	N/R	SSDs	Global
Zhao et al., 2015	CN	RAs	Brief psychoeducation	20	2337	SMI	Global

k = total number of RCTs; N = number of included subjects; N/R = Not Reported.
AU = Australia; CN = China; JP = Japan; UK = United Kingdom; US = United States of America.
ACT = Assertive Community Treatment; CCT = Compulsory Community Treatment; CIs = Caregiver Interventions; CM = Case Management; CMH = Community Mental Health; EISs = Early Intervention Services; ICM = Intensive Case Management; PS = Peer Support; SE = Supported Employment; RAs = Recovery–based Approaches.
SMI = Severe Mental Illness; SSDs = Schizophrenia Spectrum Disorders.

Table 2. Summary of reported findings: clinical and psychosocial outcomes.

Author(s), year	*Category*	*Intervention*	*Outcome*	*Assessment tool*	*k*	*N*	*Measure*	*ES [95%CI]*	*P value*	*I^2 (%)*	*Grade*
Ashcroft et al., 2018	CIs	Caregiver intervention	Hospital admission	–	10	2785	RR	0.62 [0.46 to 0.84] **	<0.01	58.0	moderate
Correll et al., 2018	EISs	EISs	Hospital admission	–	10	2105	RR	0.74 [0.61 to 0.90] **	<0.01	47.5	moderate
			Functioning	*GAF*	7	1005	SMD	0.21 [0.09 to 0.34] **	<0.01	0.0	high
			QoL	*QLS* *SF–12*	4	505	SMD	0.23 [0.00 to 0.46] *	<0.05	34.1	moderate
Dieterich et al., 2017	CM/ACT/ICM	ICM	Hospital admission	–	11	1516	RR	0.96 [0.74 to 1.23]	0.72	69.6	N/A
			Functioning	*GAF*	5	818	MD	3.41 [1.66 to 5.16] ***	<0.001	0.0	moderate
			QoL	*LQoLP*	3	274	MD	–0.13 [–0.38 to 0.12]	0.29	0.0	N/A
Farrelly et al., 2013	RAs	User–held records	Hospital admission	–	4	597	RR	0.99 [0.71 to 1.38]	0.94	41.4	N/A
Fuhr et al., 2014	PS	Peer–delivered intervention	Functioning	*GAF* *RSES* *SFS* *WBS*	2	378	SMD	–0.22 [–0.49 to 0.04]	0.09	38.0	N/A
			QoL	*MANSA* *QoLI* *QoLI–b* *WHOQOL–BREF*	6	1335	SMD	0.35 [–0.08 to 0.79]	0.11	93.0	N/A
Ibrahim et al., 2014	RAs	Strengths–based approach	Functioning	*IADL* *PRCF* *SCS* *UCDI*	5	363	SMD	0.28 [–0.27 to 0.82]	0.32	82.0	N/A
			QoL	*LQoLP* *OQLQ*	2	105	SMD	–0.24 [–76.94 to 28.93]	0.37	99.0	N/A
Kinoshita et al., 2013	SE	SE	Hospital admission	–	2	455	RR	0.71 [0.53 to 0.96] *	<0.05	31.6	low
			Functioning	*GAS*	3	623	MD	–0.7 [–2.82 to 1.41]	0.51	0.0	N/A
			QoL	*LQoLP* *QoLI*	5	867	MD	0.04 [–0.1 to 0.18]	0.59	14.8	N/A
Kisely et al., 2017	CCT	CCT	Hospital admission	–	2	416	RR	0.98 [0.79 to 1.21]	0.83	29.2	N/A
			QoL	*QoLI*	2	406	MD	–0.22 [–0.95 to 0.50]	0.55	93.0	N/A
Lean et al., 2019	RAs	Self–management education	Hospital admission	–	10	889	RR	0.75 [0.51 to 1.08]	0.12	40.0	N/A
			Functioning	*GAF* *GAS* *REHAB scale*[†] *SASS* *SDSS*	14	1805	SMD	–0.90 [–1.34 to –0.45] ***	<0.001	95.0	very low

				SFS *SLoF* *SFI*[†] *WSAS*							
			QoL	*MANSA* *PGWB* *QLI* *QLS* *QLS–A* *QOLS* *QoL.BD–b* *WHOQOL–BREF*	7	980	SMD	–0.25 [–0.37 to –0.12] ***	<0.001	0.0	moderate
Malone et al., 2007	CM/ACT/ICM	CMH teams	Hospital admission	–	3	587	RR	0.81 [0.67 to 0.97] *	<0.05	27.9	moderate
Pharoah et al., 2010	CIs	Caregiver intervention	Functioning	*SFS*	3	90	MD	–8.05 [–13.27 to –2.83] ***	<0.001	63.3	moderate
Zhao et al., 2015	RAs	Brief psychoeducation	Hospital admission	–	2	188	RR	0.88 [0.43 to 1.79]	0.72	0.0	N/A
			Functioning	*GAF* *GAS*	2	101	SMD	–0.5 [–5.48 to 4.47]	0.84	58.3	N/A

*p<0.05; **p<0.01; ***p<0.001.

95%CI = 95% Confidence Interval; ES = Effect Size; I^2 = I^2 heterogeneity measure; k = number of included RCTs; N = number of included subjects; N/A = Not Assessed.

MD = Mean Difference; QoL =Quality of Life; RR = Risk Ratio; SMD = Standardized Mean Difference.

ACT = Assertive Community Treatment; CCT = Compulsory Community Treatment; CIs = Caregiver Interventions; CM = Case Management; CMH = Community Mental Health; EISs = Early Intervention Services; ICM = Intensive Case Management; PS = Peer Support; SE = Supported Employment; RAs = Recovery–based Approaches.

[†] = no further description available; GAF = Global Assessment of Functioning; GAS = Global Assessment Scale; IADL = Instrumental Activities of Daily Living; LQoLP = Lancashire Quality of Life Profile; MANSA = Manchester Short Assessment of quality of life; OQLQ = Oregon Quality of Life Questionnaire; PGWB = Psychological General Well–Being Scale; PRCF = Professional Rating of Consumer Functioning; QLI = Quality of Life Index; QLS = Heinrich's Quality of Life Scale; QLS–A = Quality of Life Scale – Abbreviated; QoLI = Lehman Quality Of Life; QoLI–b = Lehman Quality Of Life – brief version; QOLS = Quality of Life Scale; QoL.BD–b = Quality of Life in BD scale – brief version; RSES = Rosenberg Self–Esteem Scale; SASS = Social Adaptation Self–Evaluation Scale; SCS = Strauss and Carpenter Scale; SDSS = Social Disability Screening Schedule; SF–12 = Short Form 12 Health Survey; SFI = Social Functioning Interview; SFS = Social Functioning Scale; SLoF = Specific Level of Functioning scale; UCDI = Uniform Client Data Inventory; WBS = Well Being Scale; WHOQOL-BREF = World Health Organization Quality Of Life Brief instrument; WSAS = Work and Social Adjustment Scale.