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# Impact of Crisis Care on Psychiatric Admission in Adults with Intellectual Disability and Mental Illness And/Or Challenging Behavior: A Systematic Review

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## ABSTRACT

**Introduction:** Crisis intervention aims to prevent hospital admissions by providing rapid assessment and intensive support in the community. Interest is growing in the potential of crisis care for people with intellectual disabilities who often have co-occurring psychiatric disorders and challenging behaviors. They are at high risk for admission to psychiatric hospitals when they experience acute mental health crises. This review reports on a systematic search and synthesis of the available evidence on the effectiveness of crisis care in reducing psychiatric admission in adults with intellectual disabilities and mental illness and/or challenging behavior.

**Methods:** An electronic database search on EMBASE, MEDLINE, PsycINFO, CINAHL Plus, and Web of Science databases was conducted from inception until July 2021 initially, and an updated search with the same search terms was carried out until December 2022 to identify any articles that examined crisis interventions for adults with intellectual disabilities and mental illness and/or challenging behavior. All included studies were assessed for methodological quality and results were integrated through narrative synthesis.


**Results:** A total of nine studies met the inclusion criteria, including one randomized controlled trial and eight cohort single-group pre-post studies. Study quality was deemed to be weak. Based on the available evidence, crisis interventions may hold potential for preventing psychiatric admission among adults with intellectual disabilities who have mental illness and/or challenging behavior, as well as for improving outcomes related to psychological and social functioning, service satisfaction, and cost-effectiveness.

**Conclusion:** There is some evidence that crisis interventions can contribute to the reduction of psychiatric admission among adults with intellectual disabilities and mental illness and/or challenging behavior. However, definitive conclusions could not be drawn due to low certainty of evidence

## KEYWORDS

Crisis care; intellectual disability; systematic review

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presented in the current research on the topic. Further studies should focus on the essential components involved in crisis care including service models to provide evidence for clinical and cost-effectiveness that can lead to optimization of care delivery.

## BACKGROUND

Reducing psychiatric hospital admissions has long been one of the priorities for community mental health services since the deinstitutionalization movement in the 1960s. In particular, crisis interventions are identified as a possible substitute, delivering quick and temporary help for individuals experiencing a mental health crisis (Johnson, 2013). Psychiatric crisis is characterized by a severe disruption in thought, emotions, behavior, or social abilities, leading to the need for prompt attention and care (Allen et al., 2002).

Crisis-intervention models typically contain a multidisciplinary mental health team to provide all-rounded patient support. These teams often offer 24-hour access, rapid assessments and time-limited treatments carried out in community settings. The components of care include but not limited to emotional support, psychoeducation, counseling/therapy, symptom management, practical advice, and relapse prevention including medication management. Once the patient has been stabilized, they are then gradually directed to other services which can provide further help.

Crisis care models for adults and older people with mental illness or dementia may differ in remit and content across different countries. For example, in Australian and North American community mental health programs, crisis care models have been developed in a variety of configurations (Johnson, 2013; Lloyd-Evans et al., 2018), whereas in the UK, steps have been taken by the government to facilitate this model by mandating the establishment of crisis resolution and home treatment teams (CRHTTs) across the UK (Department of Health, 2001). Although there is a scarcity of recent studies on the topic, a range of earlier randomized and non-randomized studies in the United Kingdom have demonstrated that CRHTTs are associated with a decrease in hospital admissions (Glover et al., 2006; Jethwa et al., 2007; Johnson, Nolan, Houlst, et al., 2005; Johnson, Nolan, Pilling, et al., 2005; Keown et al., 2007). More recent studies have comprehensively examined the optimization of the functioning of crisis resolution teams (Lloyd-Evans & Johnson, 2014; Lloyd-Evans et al., 2018; Wheeler et al., 2015), including model fidelity (Lamb et al., 2020) and the mapping of crisis care services across England (Dalton-Locke et al., 2021), showing varied service configuration and equivocal evidence regarding their association with reduced hospital admissions (Rojas-García et al., 2023).

The provision of crisis care to individuals with intellectual disabilities is deemed particularly essential as approximately 40% are diagnosed with psychiatric disorders who exhibit both internalizing and externalizing symptoms including aggressive challenging behavior, self-harm, and disruptive or sexually inappropriate behavior (Cooper et al., 2007; Kats et al., 2013; McCarthy et al., 2010). Such symptoms are severely impairing that result in decreased quality of life (Kuhlthau et al., 2010), early mortality (Patja et al., 2001), poor social and occupational functioning (Gadow et al., 2008), and greater caregiver stress (Baker-Ericzén et al., 2005; Hassiotis et al., 2012).

Despite their significant health and care needs, individuals with intellectual disabilities, mental illness and/or challenging behavior were among the last populations to be moved from hospital to community setting for treatment and care (Torrey, 1993). Crucially, mental health clinicians have reported that they are not confident in providing adequate quality of care for these individuals (Wilkinson et al., 2012). When individuals with intellectual disabilities experience acute mental health crisis, caregivers may seek inpatient support due to the lack of assistance available in the community during a crisis, especially if it occurs at nights and weekends (Holingue et al., 2020; L. Kalb et al., 2016; Lunsky et al., 2008; Spassiani et al., 2017; Weiss et al., 2009). Studies have shown that individuals with intellectual disabilities are at particularly high risk for hospital admission (Hassiotis et al., 2008; Lunsky & Balogh, 2010; Modi et al., 2015) as well as psychotropic polypharmacy when experiencing a crisis (Charlot et al., 2020).

Whilst some admissions might be necessary in order to treat a mental disorder, the over-reliance on inpatient care could be harmful as people with intellectual disabilities might be subjected to restrictive practices such as seclusion, restraint, and stigmatization (Liggins & Hatcher, 2005; Verhaeghe et al., 2007), resulting in traumatic experience of care for them and their caregivers (Loch, 2014). In the UK, high profile scandals at inpatient units for people with intellectual disabilities have exposed grave concerns about neglect and abuse of patients, consequently leading to changes in health policy that focuses on the reduction of hospital admissions by improving services in the community (NHS England, 2015). This has led to the commissioning of Intensive Support Teams which, however, have not had a clear remit of providing crisis care for people with intellectual disabilities (NHS England, 2017). There is variation in the function of such teams across England but in their majority, they are mainly supporting the challenging behaviors pathways without explicit statement on optimal crisis care (Hassiotis et al., 2022).

Existing reviews on the effectiveness of crisis interventions have focused on people with acute mental health problems (Wheeler et al., 2015), such as psychotic illness or bipolar disorder (Molyneaux et al., 2019; Murphy et al., 2015), borderline personality disorders (Monk-Cunliffe et al., 2022) and dementia in older people (Toot et al., 2011). They showed some mixed

results, with reduced inpatient admissions for some population groups (Molyneaux et al., 2019; Murphy et al., 2015) but with no clear or sufficient evidence for others (Maconick et al., 2023; Monk-Cunliffe et al., 2022; Toot et al., 2011).

Understanding the effect of crisis care for people with intellectual disabilities can inform efforts to reduce the high-cost utilization of hospital-based services, identify pathways for effective treatment in community settings while promoting a recovery approach and aid future research directions in clinical service improvements. Hence, the aim of this review was to systematically search for and synthesize available evidence from all types of crisis interventions to assess their relative effectiveness in reducing psychiatric admissions among adults with intellectual disabilities and mental illness and/or challenging behavior.

## **METHODS**

The review was registered with PROSPERO international prospective register of systematic reviews at the Centre for Reviews and Dissemination, University of York (registration number: CRD42021264753) and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009).

### ***Eligibility Criteria***

#### ***Participants***

Papers were included if they reported on studies where: 1) participants were adults (aged 18 or above) with mild, moderate, severe or profound intellectual disabilities, mental illness and/or behaviors that challenge; 2) intellectual disability was explicitly identified such as an IQ below 70 alongside any classification system versions such as DSM (American Psychiatric Association, 2013), ICD (World Health Organization, 2004) or service defined; 3) challenging behaviors were measured by standardized questionnaires such as the Aberrant Behavior Checklist (ABC; Aman et al., 1985), the Short Version of the Dynamic Risk Outcome Scales (DROS-SV; Drieschner, 2012), The National Patients Safety Agency (NPSA) Risk Five-by-Five matrix (National Patient Safety Agency, 2008), or the Michigan Maladaptive Behavior Scale (Coelho et al., 1993); 4) at least 50% of the sample had intellectual disability; 5) the sample size was at least 10 or more.

Papers were excluded if they reported on studies where: 1) outcome data on adults were not reported separately; 2) outcome data of hospitalization were due to physical ill-health.

### ***Intervention***

Included interventions were any type of crisis interventions, including emergency care, specialist teams, home treatment teams, assertive outreach or respite care if utilized as crisis support. Interventions could have been delivered at any setting such as participants' homes, primary care settings, outpatient facilities, inpatient facilities, community mental health centers, community settings, or could have been delivered via remote or mobile technology.

### ***Outcomes***

The primary outcome in this review was psychiatric admission. Relevant reporting included 1) the number of hospital admissions for psychiatric care, or 2) the length of stay in a psychiatric hospital. The secondary outcomes of interest were as follows: 1) morbidity; 2) mortality; 3) challenging behavior; 4) psychological and social functioning; 5) quality of life; 6) cost-effectiveness; 7) contact with services; 8) satisfaction with service.

### ***Study Design and Comparisons***

There was no restriction on study design or on comparison condition. Any studies that reported original data, such as randomized controlled trials, cohort studies, case-control, and cross-sectional studies were included. Where a study had a controlled or comparison group design, data on any control condition/treatment as usual (TAU) were extracted and described.

### ***Search Strategy***

We searched the following electronic databases first from inception until July 2021: PsycINFO, MEDLINE, EMBASE, Web of Science, and CINAHL Plus. We carried out an updated search with identical search terms from July 2021 to December 2022. Keywords related to concepts of “intellectual disabilities,” “challenging behavior,” “crisis intervention” and “psychiatric admission” were combined with Medical Subject Heading terms from OVID databases and CINAHL Plus. We limited the search to studies published in English and Chinese since the first author is fluent in both languages. Dissertation, conference proceedings, book chapters, reviews, and animal studies were excluded (see Appendix 1. for the search strategy). We also searched OpenGrey literature and Google for gray literature, and identified additional relevant articles by hand-searching the reference list of the included studies and a related study that is specific to the Netherlands (i.e., Neijmeijer et al., 2018).

### **Study Selection**

Initially, title and abstract screening were conducted by the first author (TYL) for relevance. Ten percent of search results were then independently screened by a second reviewer (TO) (title and abstracts). We carried out a full-text examination of the remaining studies, and studies were identified as certain for inclusion, uncertain or excluded according to the inclusion and exclusion criteria. The reasons for exclusion were recorded. Twenty percent of full-text search results were independently screened by the second reviewer (TO). The two researchers discussed any discrepancies following title and abstract screening and full-text reviewing, and a third researcher (AH) was involved to resolve any disagreements. During the updated search, initial title and abstract screening was conducted by the second author (BV), and 6% of search results were screened by the first author (TYL). Full-text examination of potential studies was completed by the second author (BV) and 25% of these studies were screened by the first author (TYL). Any disagreement was resolved by a third researcher (AH).

### **Data Extraction**

We used a standardized form to extract data from the retrieved articles for quality appraisal and data synthesis. Extracted details included: 1) first author; 2) year of publication; 3) country; 4) study setting; 5) study design; 6) study duration; 7) sample description; 8) intervention details; 9) control or comparison details; 10) outcome measures; and 11) key results. Data extraction was carried out by the first author (TYL) and for 25% of studies, a second reviewer checked for accuracy of the information extracted (TO). The two researchers discussed any discrepancies and, when necessary, the third researcher helped to resolve the issues.

### **Quality Appraisal**

We used the Effective Public Health Practice Project (EPHPP) tool to examine the methodological qualities of the retrieved articles (Thomas et al., 2004). The EPHPP examines six criteria: 1) selection bias, 2) study design, 3) confounders, 4) blinding, 5) data collection method, and 6) withdrawals/dropouts. Each of the criteria were rated as strong (3 points), moderate (2 points) or weak (1 point), leading to a global rating. Studies with no weak ratings were classified as strong, one weak rating as moderate, and two or more weak ratings as weak. Twenty-five percent of the studies were checked by the second reviewer independently and a 100% of agreements were reached.



## Data Synthesis

Owing to the limited number of relevant studies and the diverse methodologies employed, we were not able to conduct a meta-analysis and therefore, we conducted a narrative synthesis of the evidence. We examined the relationships within and between included studies according to each criterion.

## RESULTS

### Study Selection

Here, we present the cumulative data from both searches. A total of 2671 articles were identified from the five databases. After deduplication, 2146 studies were screened by examining the title and abstract for relevance. Fifty-four studies remained after this process. While three articles could not be retrieved, the full texts of the remaining 51 studies were examined, and 45 were excluded for reasons, leaving 6 eligible studies. Another 29 relevant studies were identified from a Google Scholar search, 3 studies from a previous related overview (Neijmeijer et al., 2018), and 14 studies from hand-searching the reference list of included studies. One article was not possible to retrieve, leaving 45 articles. Only three studies met the eligibility criteria, and the remaining 42 studies were excluded with reasons (Figure 1). Overall, nine studies were included in this review: seven studies from the original search, and two studies from the updated search. We have revised the tables and flow diagram to reflect the amalgamated results of both searches.

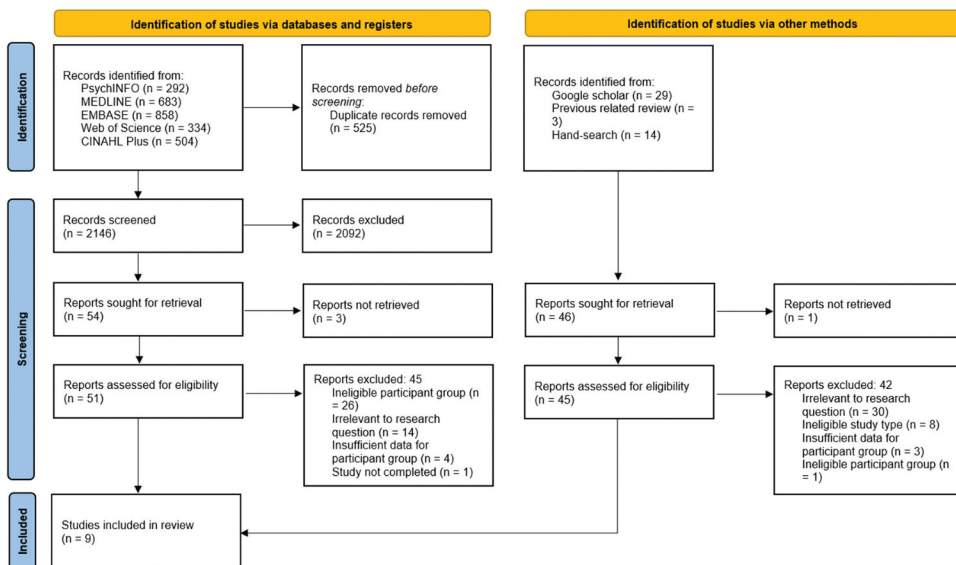


Figure 1. PRISMA flow diagram of studies included in the review.



### **Sample Characteristics**

Table S1 depicts the characteristics of the included articles. Sample sizes varied widely across the studies, ranging from 10 (Meisler et al., 2000) to 604 (Neijmeijer et al., 2019), with a total of 1121 participants in the nine studies. The mean age of participants ranged from 29 years (Holden & Neff, 2000) to 40 years (Douglass & Hurtado, 2013). The study by Richings et al. (2011) did not report the age of participants, yet we were able to infer through a web search that the intervention described was a service for adults with intellectual disabilities. Majority of participants were male in the studies (75% of the total sample). Five studies reported the ethnicity of participants. Majority of the participants were from a white ethnic background in the studies of Beasley et al. (2018), Coelho et al. (1993) and Hassiotis et al. (2022). The study by Holden and Neff (2000) had a combination of Anglo American, Hispanic and African American population, and the study conducted by Meisler et al. (2000) had a majority of African American participants.

All levels of intellectual disabilities were included among studies, from mild intellectual disability (Douglass & Hurtado, 2013; Holden & Neff, 2000; Neijmeijer et al., 2019; van Minnen et al., 1997), mild and moderate intellectual disability (Coelho et al., 1993; Meisler et al., 2000), severe and profound intellectual disability (Beasley et al., 2018; Richings et al., 2011), or all the levels of intellectual disability (Hassiotis et al., 2022). Participants were diagnosed with a variety of mental illnesses, such as psychotic disorders (Beasley et al., 2018; Hassiotis et al., 2022; Holden & Neff, 2000; Meisler et al., 2000; Richings et al., 2011), mood disorders (Beasley et al., 2018; Holden & Neff, 2000; Richings et al., 2011), behavior disorders (Beasley et al., 2018; Holden & Neff, 2000; Richings et al., 2011), substance use disorder (Holden & Neff, 2000; Meisler et al., 2000; Neijmeijer et al., 2019; Richings et al., 2011), personality disorder (Meisler et al., 2000; Richings et al., 2011), post-traumatic stress disorder (Holden & Neff, 2000; Richings et al., 2011), Attention Deficit Hyperactivity Disorder (Beasley et al., 2018; Hassiotis et al., 2022; Richings et al., 2011), autism spectrum disorder (Hassiotis et al., 2022; Richings et al., 2011) and dementia (Richings et al., 2011). Six studies also recruited participants who displayed challenging behavior such as agitation, assault, and self-harm, in addition to their mental ill health (Coelho et al., 1993; Douglass & Hurtado, 2013; Hassiotis et al., 2022; Holden & Neff, 2000; Meisler et al., 2000; Neijmeijer et al., 2019).

Regarding participants' living arrangements, six studies (total  $N = 1007$ ) included participants living in their own or family home (65%), in residential, supported homes (33%) or in inpatient or other settings (2%). Three studies did not report information on the type of community settings participants stayed during the intervention (Coelho et al., 1993; Douglass & Hurtado, 2013; Holden & Neff, 2000).

### ***Study Design, Duration, and Geographical Location***

The included studies were published between 1993 and 2022. Four studies were conducted in the United States (Beasley et al., 2018, Coelho et al., 1993; Holden & Neff, 2000; Meisler et al., 2000), three in the UK (Douglass & Hurtado, 2013; Hassiotis et al., 2022; Richings et al., 2011), and two in the Netherlands (Neijmeijer et al., 2019; van Minnen et al., 1997). Eight studies used cohort single-group pre-post designs (Beasley et al., 2018, Coelho et al., 1993; Douglass & Hurtado, 2013; Hassiotis et al., 2022; Holden & Neff, 2000; Meisler et al., 2000; Neijmeijer et al., 2019; Richings et al., 2011) and only one study was a controlled trial of an intervention (van Minnen et al., 1997). Study duration ranged from 1 year (Beasley et al., 2018; Holden & Neff, 2000; Meisler et al., 2000) to 6 years (Neijmeijer et al., 2019). In the clinical controlled trial, the intervention was delivered either in hospital or in participants' homes (van Minnen et al., 1997).

### ***Characteristics of Interventions***

#### ***Types of Crisis Care***

All studies reported to use a form of Assertive Community Treatment (ACT) model, except for Holden and Neff (2000), who examined an intensive outpatient intervention, and for Coelho et al. (1993), who described an active treatment model, although this model could be considered as assertive outreach service in its functions. The ACT model was developed in the USA, following the deinstitutionalization of patients with severe mental disorders in the 1970's. It is increasingly adopted for the outreach treatment of people with intellectual disability and enduring mental illness, who have complex needs and poor engagement with services (Hassiotis et al., 2003). The ACT model – referred to as assertive outreach services in the UK – delivers intensive, multidisciplinary, and client-focused treatment in people's own homes with the aim of improving psychological and social functioning and of reducing crisis admissions to psychiatric hospitals (Neijmeijer et al., 2019). Assertive community treatment is designed to function as a complementary care along with existing support from community learning disability teams or other care providers.

The seven studies that used the ACT model showed some variations in their service delivery. Four studies (Beasley et al., 2018; Douglass & Hurtado, 2013; Meisler et al., 2000; van Minnen et al., 1997) used ACT as described above, however, in the study of Neijmeijer et al. (2019), a Function ACT (FACT) was utilized. FACT is an adapted version of the ACT model in the Netherlands, which provides a combination of individual and team approach to case management, with the flexibility of increasing treatment intensity based on changing needs and risks. Depending on clients' needs, FACT offers intensive

assertive outreach treatment as one of their functions to less stable patients who are at risk of relapse or readmission, but also overseeing more stable, long-term clients with individual case management (van Veldhuizen, 2007). The study by Richings et al. (2011) also used combination of services. In their study, the Birmingham Community Assessment and Treatment Service (BCATS) merged assertive outreach treatment, day assessment and a small number of inpatient beds, thus offering their clients the flexibility of moving between the three components, depending on their changing needs.

Finally, the study by Hassiotis et al. (2022) examined Intensive Support Teams. These teams offer a form of specialist outreach service for people with intellectual disabilities and challenging behaviors, often after an episode of challenging behavior, with the aim of reducing placement breakdowns. Unlike the other studies in this review, Hassiotis et al. (2022) evaluated not only a single service but mapped the available Intensive Support Teams across England in terms of their distribution, functions, characteristics, clinical and cost-effectiveness, and explored stakeholders' and professionals' experiences with such services. Two distinct models were identified with overlapping functions – enhanced models that are integrated within the community intellectual disability services, and independent models that are standalone services. The two models showed similar cost and clinical outcomes, and they were generally well-received by service users and carers, nevertheless, limited evidence was found about providing consistent crisis care for people with intellectual disabilities by these teams (i.e., 66% of the Intensive Support Teams reported working extended hours and 52% operated a duty or crisis line).

### ***Crisis Team Composition***

There was variation in team composition across the studies. All teams included a psychiatrist and/or a psychologist (except of the study by Douglass and Hurtado (2013), which had a team of nurses and support workers). Some teams also comprised of behavioral therapists (Holden & Neff, 2000; Neijmeijer et al., 2019), social workers (Beasley et al., 2018; Hassiotis et al., 2022; Meisler et al., 2000; Neijmeijer et al., 2019; van Minnen et al., 1997), psychiatric nurses (Meisler et al., 2000; Neijmeijer et al., 2019; van Minnen et al., 1997), intellectual disability nurses (Hassiotis et al., 2022), occupational and speech and language therapists (Hassiotis et al., 2022; Richings et al., 2011), licensed physician (Beasley et al., 2018), rehabilitation counselors (Coelho et al., 1993), physiotherapist, art therapist or dietitian (Hassiotis et al., 2022). All teams included network partners such as family and direct care staff, community intellectual disability staff, primary medical staff, and staff at schools or mental health services who were involved in the existing care of clients.

### ***Intervention Components***

Interventions varied and many had multiple components. Three studies explicitly identified crisis intervention or planning for participants in crisis (Beasley et al., 2018; Holden & Neff, 2000; Richings et al., 2011). Three interventions continued to provide input to support clients when they were hospitalized (Neijmeijer et al., 2019; Richings et al., 2011; van Minnen et al., 1997). Six studies delivered psychological treatments (e.g., cognitive-behavioral therapy, therapy for substance abuse, emotion regulation and trauma-based treatment) as part of their approach (Coelho et al., 1993; Hassiotis et al., 2022; Holden & Neff, 2000; Meisler et al., 2000; Neijmeijer et al., 2019; van Minnen et al., 1997). Psychiatric evaluation and assessment were reported in 5 papers (Beasley et al., 2018; Douglass & Hurtado, 2013; Holden & Neff, 2000; Meisler et al., 2000; Richings et al., 2011). In the study by Hassiotis et al. (2022), the main treatment method was Positive Behavioral Support, that is a person-centered approach, using behavioral techniques to reduce challenging behavior and to enhance quality of life. 6 studies also reported on usual care, including prescribing psychotropic medication, and offering support for improving daily living and social skills, employment, and community participation (Beasley et al., 2018, Coelho et al., 1993; Holden & Neff, 2000; Meisler et al., 2000; Neijmeijer et al., 2019; van Minnen et al., 1997). All interventions reported to adopt an individualized and person-centered approach with the active involvement of the client. An important element of 6 interventions was involving participants' social network by offering consultation, education and support services to family members and direct care staff, thus applying a multidimensional approach (Beasley et al., 2018, Coelho et al., 1993; Hassiotis et al., 2022; Holden & Neff, 2000; Meisler et al., 2000; van Minnen et al., 1997).

### ***Differences of Interventions***

As already mentioned, all studies used assertive outreach services to assist clients who lived in the community, except for the study of Holden and Neff (2000), which offered an intensive outpatient service. The reviewed studies showed some differences regarding their interpretation of intensive or assertive treatment, or where data were available, in the frequency of contact with participants. The most frequent contact was reported by Holden and Neff (2000), which was up to five times a week during crisis. Hassiotis et al. (2022) found that most IST models had one to three contacts per week with clients, and Coelho et al. (1993) reported two visits per week. In the study by Meisler et al. (2000), participants had contact with the ACT staff members three times per week, along with a 24-hour supervision at their community living arrangements. Although not reporting on frequency of contact, Douglass and Hurtado (2013) described their ACT model being assertive as it offered meaningful engagement and assertive follow-ups for people with enduring mental illness who would otherwise be difficult to engage with mainstream services.

As mentioned earlier, the studies by Neijmeijer et al. (2019) and Richings et al. (2011) examined services that used a flexible approach that allowed treatment intensity to be scaled up depending on clients' needs.

## **Measures Used**

### **Primary Outcome**

Psychiatric hospitalization was measured as the number of admissions or days in hospital. All studies reported this information, and four studies also reported information about the length of stay (Hassiotis et al., 2022; Holden & Neff, 2000; Meisler et al., 2000; Richings et al., 2011). All the data were collected from patients' records by the research teams.

### **Secondary Outcomes**

Six studies measured participants' psychological and social functioning. Three of these studies (Douglass & Hurtado, 2013; Neijmeijer et al., 2019; Richings et al., 2011) used the Health of the Nation Outcome Scales: Learning Disabilities (HoNOS-LD; Roy et al., 2002), which has well-established validity and reliability. The study by van Minnen et al. (1997) used the Psychopathology Inventory for Mentally Retarded Adults (PIMRA; van Minnen et al., 1994) and the Reiss Screen for Maladaptive Behavior (van Minnen et al., 1995). Coelho et al. (1993) used the AAMD Adaptive Behavior Scale (Nihira et al., 1974), and reported adequate internal consistency. Hassiotis et al. (2022) measured psychological functioning with the Psychiatric Assessment Schedule for Adults with Developmental Disabilities (PAS-ADD) Clinical Interview (Prosser et al., 1998), which has good psychometric properties and inter-rater validity in terms of case recognition (Prosser et al., 1998).

Participants' quality of life was measured in two studies. Douglass and Hurtado (2013) used the Maslow Assessment of Needs Scale: Learning Disabilities (MANS-LD; Skirrow & Perry, 2009), whereas Hassiotis et al. (2022) employed the Quality of Life Questionnaire (QoL-Q, Shalock & Keith, 1993) and measured health-related quality of life with the EuroQol-5 Dimensions, five-level version (EQ-5D-5 L, Herdman et al., 2011). From the four studies that measured satisfaction of services, two used self-reported questionnaires (Douglass & Hurtado, 2013; Neijmeijer et al., 2019), one used qualitative methods such as semi-structured interviews and focus groups (Hassiotis et al., 2022), and the one remaining study did not mention the measurement instrument used (Holden & Neff, 2000).

Challenging behavior was measured variously by five studies. Beasley et al. (2018) and Hassiotis et al. (2022) used the Aberrant Behavior Checklist (ABC; Aman et al., 1985), and Neijmeijer et al. (2019) used the Short Version of the Dynamic Risk Outcome Scales (DROS-SV; Drieschner, 2012) along with the historical items of the Historical Clinical Future 30 (HKT-30; Werkgroep

Risicotaxatie Forensische Psychiatrie, 2002). These measures are psychometrically robust owing to their good validity and reliability (Aman et al., 1985; Delforterie et al., 2018; Hildebrand et al., 2005). The fourth study (Douglass & Hurtado, 2013) used The National Patients Safety Agency (NPSA) Risk Five-by-Five matrix (National Patient Safety Agency, 2008), which does not have a published evaluation of its psychometric properties. The NPSA Risk Five-by-Five assesses the likelihood and severity of risks within five domains such as harm to others, harm to self, harm from others, and accidents or other risk-related behaviors (Douglass & Hurtado, 2013). Lastly, the study by Coelho et al. (1993) used the Michigan Maladaptive Behavior Scale (Coelho et al., 1993), which measures challenging behavior across 20 areas (e.g., self-injurious behavior, physical assault, pica, etc.), and Part two of the AAMD Adaptive Behavior Scale (Nihira et al., 1974), which focuses on maladaptive behaviors across 14 domains (e.g., antisocial behavior, violent, and destructive behavior, etc.). Both scales were reported to have good internal consistency (Coelho et al., 1993).

### **Methodological Quality**

Table 1 presents the rating of each domain and the global ratings of the included studies by the EPHPP tool. First, all studies scored moderately in the category of selection bias as study participants were referred from a source (e.g., hospital, community mental health services and clinics) in a systematic manner. Only one study was rated as strong for study design since it was a randomized controlled clinical trial (RCT) (van Minnen et al., 1997), whereas all other studies were cohort designs that did not have a control group. The RCT also scored strongly on confounders as the authors reported no important differences between the hospital group and outreach treatment group prior to the intervention. The study by Hassiotis et al. (2022) was rated moderate on confounders as they were controlling for various confounders during their analyses. The remaining six studies were rated as weak in this category due to not having a control group, which increases the potential for confounders. The RCT scored moderately on blinding as they did not describe the blinding procedure of participants. All cohort studies were unblinded; therefore, they were rated as weak. In addition, the RCT did not follow the CONSORT guidance (Begg et al., 1996), thus introducing possible bias.

Regarding data collection, seven studies were rated as strong since valid and reliable outcome measures were used (Beasley et al., 2018, Coelho et al., 1993; Douglass & Hurtado, 2013; Hassiotis et al., 2022; Neijmeijer et al., 2019; Richings et al., 2011; van Minnen et al., 1997), whereas the remaining two studies (Holden & Neff, 2000; Meisler et al., 2000), which did not describe the psychometric information of their outcome measures were rated as weak. Six studies were rated as strong on withdrawals/dropouts since 80% to 100% of their participants completed the study (Coelho et al., 1993; Douglass &

**Table 1.** Quality appraisal.

Study	Component rating							Global rating
	Selection bias	Study Design	Confounders	Blinding	Data collection method	Withdrawals and dropouts		
<i>Controlled Clinical Trial</i> van Minnen et al. (1997)	Moderate	Strong	Strong	Moderate	Strong	Strong	Strong	Strong
<i>Cohort Studies</i> Beasley et al. (2018)	Moderate	Moderate	Weak	Weak	Strong	Moderate	Moderate	Weak
Coelho et al. (1993)	Moderate	Moderate	Weak	Weak	Strong	Strong	Strong	Weak
Douglass and Hurtado (2013)	Moderate	Moderate	Weak	Weak	Strong	Strong	Strong	Weak
Hassiotis et al. (2022)	Moderate	Moderate	Moderate	Weak	Strong	Strong	Strong	Moderate
Holden and Neff (2000)	Moderate	Moderate	Weak	Weak	Weak	Strong	Strong	Weak
Meisler et al. (2000)	Moderate	Moderate	Weak	Weak	Weak	Strong	Strong	Weak
Neijmeijer et al. (2019)	Moderate	Moderate	Weak	Weak	Strong	Weak	Weak	Weak
Richings et al. (2011)	Moderate	Moderate	Weak	Weak	Strong	Moderate	Moderate	Weak



Hurtado, 2013; Hassiotis et al., 2022; Holden & Neff, 2000; Meisler et al., 2000; van Minnen et al., 1997). Two studies had a follow-up rate of 60 to 79%, therefore scored moderately (Beasley et al., 2018; Richings et al., 2011). The remaining one had over 50% of dropouts and thus scored weakly (Neijmeijer et al., 2019). Overall, the global ratings of bias indicates the quality of RCT as strong, one study as moderate (Hassiotis et al., 2022), and all other cohort studies as weak.

### **Primary Outcome**

The current review was able to identify only one RCT (van Minnen et al., 1997; Table 2). This study compared the effectiveness of an outreach treatment with a specialized hospital treatment among patients with intellectual disabilities and severe mental disorders. Among the 25 outreach-treated patients, only four had to be admitted to hospital, meaning an 84% prevention of mental health hospital admission.

### **Secondary Outcomes**

In terms of psychological and social functioning, the study reported nonsignificant effect in improving participant psychiatric symptoms when compared to the hospital care. The outreach treatment seemed to be more cost-effective than the hospital treatment, as the study demonstrated that the mean total cost of outreach treatment (USD \$24,221 per patient) was around 40% lower than that of hospital treatment (USD \$41,134 per patient). Regarding contact with services, the authors reported that a mean of 28.1 hours was assigned to each outreach-treated patient, including in-person contact between the team and the clients, their carers and third parties (e.g., community services). The remaining secondary outcomes of challenging behavior, quality of life, and satisfaction with services were not reported.

### **Cohort Studies**

The current review was able to identify eight cohort studies which were all single-group pre-post design (Beasley et al., 2018, Coelho et al., 1993; Douglass & Hurtado, 2013; Hassiotis et al., 2022; Holden & Neff, 2000; Meisler et al., 2000; Neijmeijer et al., 2019; Richings et al., 2011). Their results are summarized in Table 2.

### **Primary Outcome**

With respect to psychiatric admission, the evidence for reducing psychiatric hospitalization was fairly consistent across studies. Regarding the number of admissions, six out of eight interventions reported a reduction in individuals experiencing inpatient psychiatric hospitalizations. The reduction in admission ranged from 37% to 79% (Beasley et al., 2018; Douglass & Hurtado, 2013; Holden & Neff, 2000; Neijmeijer et al., 2019; Richings et al., 2011). One study

Table 2. Results of the included studies.

Study	Primary Outcome			Secondary Outcomes			
	Length of stay	Challenging behavior	Psychological and social functioning	Quality of life	Satisfaction with services	Contact with services	Cost-effectiveness
<b>Randomised Controlled Trial</b>							
van Minnen et al. (1997)	Not reported	Not reported	No significant differences were found between the hospital group and outreach treatment group	Not reported	Not reported	In average 28.1 hours was assigned to each participant during the 28 weeks of study duration, compared to 24-hour care per day in the hospital treatment group	The total cost of outreach treatment (USD \$24,221 per patient) was around 40% lower than that of hospital treatment (USD \$41,134 per patient)
	Number of psychiatric admissions						
	Among the 25 outreach-treated patients, only four had to be admitted to hospital, meaning an 84% prevention from admitting to the special hospital						
<b>Cohort Studies</b>							
Beasley et al. (2018)	Not reported	Significant reduction in Hyperactivity ( $t = 2.12, d = .46, p < .05$ ), Irritability ( $t = 2.47, d = .60, p < .05$ ), and Lethargy subscales ( $t = 2.12, d = .50, p < .05$ )	Not reported	Not reported	Not reported	Not reported	Not reported
	A 54.7% reduction in the percentage of individuals experiencing inpatient psychiatric hospitalizations, from 53% to 24% ( $z = 12.00, p < .001$ ).						

(Continued)

Table 2. (Continued).

Study	Primary Outcome		Secondary Outcomes					
	Number of psychiatric admissions	Length of stay	Challenging behavior	Psychological and social functioning	Quality of life	Satisfaction with services	Contact with services	Cost-effectiveness
Coelho et al. (1993)	From the total acute psychiatric service use (4848 hours) and of state hospitalization (635 days) used during the study, participants in the active model used 61% of the acute inpatient psychiatric services and no long-term state inpatient services, whereas in the traditional model, participants used less acute community inpatient days but all the state inpatient hospital days		Maladaptive behavior decreased significantly on both scales: on the AAMD-Maladaptive Behavior Scale, from $M = 53.74$ to $M = 22.50$ in active treatment group vs. $M = 53.43$ to $M = 53.00$ in traditional treatment group, $F(1,3) = 6.05, p < .001$ ; on the Michigan Maladaptive Behavior Scale from $M = 12.65$ to $M = 6.45$ in active treatment group vs. $M = 11.96$ to $M = 11.48$ in traditional treatment group, $F(1,3) = 5.57, p < .001$ .	Significant increase in adaptive functioning in the active treatment group, from $M = 199.35$ to $M = 211.86$ compared to the traditional treatment group, $M = 205.96$ to $M = 201.30$ , $F(1,3) = 5.76, p < .001$	Not reported	Not reported	In the active treatment model, twice a week direct contact services, compared to once a month in the traditional model	The cost of active treatment model was 40% higher than the traditional service model (although the use of active treatment model reduced the more costly inpatient hospital care)
Douglass and Hurtado (2013)	A 78.9% decrease in the number of individuals experienced hospital admission, from 5 people (38%) prior to AOT to 1 person (8%) after AOT input.	Not reported	Significant reduction in the risk of harm to self ( $z = -2.50, p = .012$ ), risk of harm from others ( $z = -2.59, p = .010$ ), risk of harm to others ( $z = -2.55, p = .011$ ), risk of accidents ( $z = -2.54, p = .011$ ) and other risk behavior ( $z = -2.91, p = .004$ ).	Significant reduction in the mean HoNOS-LD scores ( $z = -3.18, p = .001$ )	The trend data showed that the service has a positive result on participant's quality of life	The trend data illustrated that the participants felt satisfied with the service	Not reported	Not reported

(Continued)

**Table 2.** (Continued).

Study	Primary Outcome		Secondary Outcomes					
	Number of psychiatric admissions	Length of stay	Challenging behavior	Psychological and social functioning	Quality of life	Satisfaction with services	Contact with services	Cost-effectiveness
Hassiotis et al. (2022)	Small number of admissions over the study period: about one or two per month for all areas, and 40 discharges.	Reduction in days spent in psychiatric inpatient hospitals: 6 months prior to enrollment in Independent IST sample ( $n = 109$ ) average days spent was 6.94, in enhanced IST sample ( $n = 114$ ) 4.04, whereas for the period of 6 months prior to enrollment to end of 9 months follow-up, independent IST sample ( $n = 100$ ) spent 8.63 days in psychiatric inpatient hospital, and in the enhanced IST sample ( $n = 104$ ) it was 5.26 days.	At follow-up, the observed ABC-C score was reduced by 13% for the enhanced model and by 21% for the independent model. (Improvement in change of total ABC-C scores from baseline to 9 months (unadjusted model: $\beta = 3.08$ , 95% CI: $-7.32$ to $13.48$ , adjusted model: $\beta = 4.27$ , 95% CI $-6.34$ to $14.87$ )	Data is available only for comparison between the independent and enhanced IST at 9 months in change in PAS-ADD Clinical Interview.	Change in QoL-Q score between baseline and 9 months for independent IST compared to enhanced IST (unadjusted learning model: $\beta = 0.75$ , 95% CI $-3.62$ to $2.11$ ; adjusted model: $\beta = -2.63$ , 95% CI $-5.65$ to $0.40$ )	IST care was valued by most stakeholders (i.e., family and paid carers, and adults with learning disabilities). The service was found to be supportive and the effort of IST staff to implement reasonable adjustments and involve stakeholders in care planning were appreciated.	Duration of contact: majority of ISTs (84%) had contact with clients for 3–12 months. Frequency of contact: less than once per week in 4% of ISTs, once to three times per week in 68%, other frequency in 27%.	Data is available only for comparison between the independent and enhanced IST models in cost effectiveness: independent model is more costly per case than the enhanced model.

(Continued)

**Table 2.** (Continued).

Study	Primary Outcome				Secondary Outcomes			
	Number of psychiatric admissions	Length of stay	Challenging behavior	Psychological and social functioning	Quality of life	Satisfaction with services	Contact with services	Cost-effectiveness
Holden and Neff (2000)	A 65% reduction of hospitalization for the total sample, from a mean of .82 (SD = .96) to .29 (SD = .54) ( $p < .005$ ). When examining the sample who hospitalized in the state hospital prior to the treatment, a 74% reduction of state hospitalization could be observed, from a mean of 1.64 to .43 ( $p < .0001$ ) after the treatment	A 72.6% reduction of length of stay for the total sample, from an average of 62.79 days (SD = 108.64) to 17.18 days (SD = 43.125) ( $p < .03$ ). When examining the sample who hospitalized in the state hospital prior to the treatment, a 74% reduction of state hospitalization could be observed, from a mean of 125.57 to 28.64 days ( $p < .02$ ) after the treatment	Not reported	Not reported	Not reported	Most persons served by the clinic were pleased by the new service	Participants had regular contact with staff members when in crisis, as frequent as five times per week in the intensive outpatient treatment model, compared to 1 to 3 months contacts in the preintervention period	Estimated savings of USD \$95,000 for the year
Meisler et al. (2000)	A 55.6% increase of the total number of admissions, from 9 times prior to intervention to 14 times after intervention	A 79.7% decrease in the total inpatient days, from 187 days prior to intervention to 38 days after intervention	Not reported	Not reported	Not reported	Not reported	Not reported	A 15% decrease in the total cost of services, from around USD \$198,000 per client during the pre-enrollment year to around USD \$168,000 per client during the post-enrollment period

(Continued)

Table 2. (Continued).

Study	Primary Outcome		Secondary Outcomes					
	Number of psychiatric admissions	Length of stay	Challenging behavior	Psychological and social functioning	Quality of life	Satisfaction with services	Contact with services	Cost-effectiveness
Neijmeijer et al. (2019)	Significant reduction of admissions to health care over the 6-years period (linear time = $-0.01$ (SE = .00), 95% Confidence interval linear time [ $-0.01$ , $-0.01$ ], $p < .01$ )	Not reported	Significant reduction of contacts with police and justice (linear time = $-0.01$ (SE = 0.00), 95% Confidence interval linear time [ $-0.01$ , $-0.00$ ], $p < .01$ ), and total DROS-SV score over the 6-years period (linear time = 0.24 (SE = 0.06), 95% Confidence interval linear time [0.13, 0.36], $p < .01$ ). This results in lower final risk judgment (linear time = $-0.03$ (SE = 0.00), 95% Confidence interval linear time [ $-0.03$ , $-0.02$ ], $p < .01$ ).	Significant reduction of the total score on the HoNOS-LD (linear time = $-0.11$ (SE = .03), 95% Confidence interval linear time [ $-0.17$ , $-0.06$ ], $p < .01$ )	Not reported	Client satisfaction remained unchanged	Not reported	Not reported
Richings et al. (2011)	The service reduced hospital admission among 37% of the participants. When compared with previous model, there is a 61.5% decrease of the percentage of people treated as inpatients, from 91% to 35% in the new service.	The service reduced the number of bed days among 28% of the participants. When compared with previous model, there is a 62.6% of reduction in the length of stay, from 198 days to 74 days in the new model (chi-square = 4.40, $p = .036$ )	When compared with previous model, a 66.7% reduction of aggressive incidents, from 15 times to 5 times per month under the new service model. In particular, there is a 63.6% decrease in the incidents involving physical violence, from 11 times to 4 times per month under the new service model	Improvement in available serial HoNOS-LD scores could be observed among 64% of participants	Not reported	Not reported	Not reported	Not reported

reported a negative effect of the intervention, where the total number of admissions during the post-enrollment period was around 56% higher than during the pre-enrollment period (Meisler et al., 2000). The study by Coelho et al. (1993) found some mixed results: participants in the active treatment condition used more acute, short-term inpatient psychiatric services (61%) compared to participants allocated to the traditional service model; however, they have not spent any days in long-term state inpatient services. Participants in the traditional model spent less time in acute psychiatric services but they used all of the long-term inpatient hospital days that was recorded during study duration. Among the 4 cohort studies which reported the length of stay in inpatient settings, all of them reported a reduction in the number of inpatient days, ranging from a 28% to 80% decrease (Holden & Neff, 2000; Meisler et al., 2000; Richings et al., 2011).

### *Secondary Outcomes*

Six studies reported a reduction in challenging behavior. In the study of Beasley et al. (2018), participants improved in hyperactivity, lethargy, and irritability. Neijmeijer et al. (2019) also demonstrated improvement over time regarding challenging and criminal behavior among clients. In the study by Douglass and Hurtado (2013), participants presented less risk of harm to themselves and the people around them. Richings et al. (2011) and Coelho et al. (1993) also illustrated a reduction in aggression and physical violence under the new service when compared with the previous model. Hassiotis et al. (2022) reported a reduction in challenging behavior in both models of enhanced and independent Intensive Support Teams.

Psychological and social functioning was measured by five studies, and all of them reported positive results. In the study by Hassiotis et al. (2022), data were available only for comparison between the two Intensive Support Teams models. All three studies that used HoNOS-LD demonstrated a reduction in the scores, indicating that participants improved in their psychological and social functioning gradually (Douglass & Hurtado, 2013; Neijmeijer et al., 2019; Richings et al., 2011). Coelho et al. (1993) also found improvement in participants' adaptive functioning in the intensive, active treatment group as opposed to the traditional model.

Quality of life was measured by two studies. Douglass and Hurtado (2013) did not have sufficient data for qualitative analysis, but they suggested the service could improve participant's quality of life by looking at the data trend, whereas in the study by Hassiotis et al. (2022), comparison data were available only for the two distinct types of Intensive Support Team models, therefore no definite conclusion could be drawn about post-treatment effects on quality of life.

In terms of cost-effectiveness, four studies measured the cost of the services, and two of them reported a reduction in cost. Holden and Neff (2000) showed that the costs of the intensive outpatient interventions could be offset by a



significant reduction in hospital costs, resulting in an estimated savings of USD \$95,000 for the year. However, the authors did not intend to examine the cost-effectiveness of the services, thus the calculation did not represent a formal cost analysis. Meisler et al. (2000) also reported a 15% decrease in the total cost of services from the pre-enrollment year (~USD \$198,000 per client) to the post-enrollment year (~USD \$168,000 per client) by reducing staff supervision and the usage of hospital care. The authors concluded that the ACT team cost less than the previous treatment provided, yet the cost of the new program per year was still high. Although Coelho et al. (1993) did not report exact figures on cost, they concluded that while the cost of the active treatment model was 40% higher than the traditional treatment model, it significantly reduced long-term admissions to more costly state hospitals. Hassiotis et al. (2022) reported data only on the comparison between the two models of Intensive Support Teams, thus no inferences could be made about the cost of Intensive Support Teams in comparison to other service models.

Satisfaction with services was assessed by four studies: three reported adequate levels of satisfaction (Douglass & Hurtado, 2013; Hassiotis et al., 2022; Holden & Neff, 2000), whereas one study reported no change in client satisfaction over the 6-years treatment (Neijmeijer et al., 2019). Regarding contact with services, Coelho et al. (1993) reported that the active treatment model involved direct contact twice a week, compared to once a month in the traditional model. In the study by Hassiotis et al. (2022), frequency of contact varied among the Intensive Support Teams, with the majority of teams (68%) having contact with people they support once to three times per week. The study by Holden and Neff (2000) reported that clients in crisis had regular contact with staff members, up to five times a week, compared to be seen once a month to every 3 months previously.

## DISCUSSION

### *Main Findings*

This study reports on a systematic assessment of the impact of crisis interventions on psychiatric admissions among adults with intellectual disabilities and mental illness and/or challenging behavior, a key performance indicator in acute psychiatric care. The limited evidence showed promise that different models of crisis support reduced both the number of hospitalizations and length of stays in inpatient settings among this population by up to 80%; however, the majority of the studies were single site and were subject to reporting and other bias, which reduces the certainty of the evidence to low. The study with the longest follow-up by Neijmeijer et al. (2019) suffered from

a significant attrition rate with only 46% cases left in the second assessment time point, 13% at the third and 1% at the final one.

In addition to admission, four studies were able to demonstrate a decrease in the length of stay in inpatient settings, and only one study reported a negative and opposite effect of the intervention, where the total number of participants who required inpatient admissions decreased but the total number of admissions increased after the program.

Although the evidence is limited, the signal of positive impact of crisis care on psychiatric admissions for people with intellectual disabilities indicates that this may be a useful approach but requires further examination in unraveling its constituent parts and their contribution to a positive outcome for this population group. Further findings of this review also suggest that crisis care improved other outcomes, such as reduced challenging behavior, enhanced psychological and social functioning and quality of life, satisfaction with services and reduction of cost, and increased contact frequency. These findings are consistent with an overview by Neijmeijer et al. (2018) that described the ACT model and its adaptation and implementation in the Netherlands. Their review focused on assertive outreach for people with mild intellectual disabilities or borderline intellectual functioning and mental health problems or challenging behavior and concluded that ACT showed promise in improving several outcomes, including psychiatric hospitalization, challenging behavior, and psychological and social functioning.

### ***Strengths and Limitations***

To our knowledge, this study is the first systematic review to investigate the impact of any crisis intervention in reducing psychiatric admission and other outcomes of importance among adults with intellectual disabilities and mental illness and/or challenging behavior. Given the negative impacts of hospitalization, it is crucial to seek effective alternatives to manage the mental health needs of this population, thus this review addresses a highly urgent research question that may elucidate clinically important conclusions about improving crisis care for people with intellectual disabilities.

Nonetheless, there are a number of important limitations that should be considered in the interpretation of our results. Four studies were carried out two decades ago, including the only controlled clinical trial in this review. This suggests that the evidence might be outdated and the results need to be interpreted with caution. Furthermore, studies might not have been included in the current review, owing to under ascertainment of crisis care. In the initial scoping review, we identified significant literature about crisis care but not related to intellectual disabilities, hence we decided to have a broad definition arising from literature in the adult mentally ill. However, we believe that the

search terms in the current review could most likely identify any relevant papers about crisis care for people with intellectual disabilities.

It also needs to be emphasized that psychiatric admission or length of days in hospitals were not the primary research question in any but one of the identified studies. In most of the studies, crisis care was only included as one element of the multi-component interventions that aimed to enhance the overall wellbeing of people with intellectual disabilities and mental illness. None of the examined studies separated the active ingredients of crisis care to establish which elements contributed to the reduction of psychiatric admission, and due to study designs, no causal relationship could be drawn regarding the effective components of the interventions, which result corresponds with previous research about crisis care for the general population (Wheeler et al., 2015). Taken together, we cannot reach robust conclusions about the impact of crisis care in reducing psychiatric admission among this group. This was further compounded by the variability of studies and their reporting which precluded quantitative synthesis of the results. Despite our search strategy and broad inclusion criteria, it is also possible that we have not included other studies which are still in progress or are yet to be published.

### ***Implications for Practice and Future Research***

This current systematic review illustrates the potential of crisis care in substituting psychiatric admission to improve health outcomes for people with intellectual disabilities and co-occurring mental ill health. There have been recent policy decisions to increase the delivery of crisis care to address the mental health needs of people with intellectual disabilities. In the UK, for example, the government plans to increase investment to ensure that 24-hour crisis intervention is available in every local health system (NHS England, 2019). It is aimed that by the end of 2024, inpatient hospitalization services will be halved when compared to the 2015 levels. Moreover, local systems will require robust support to manage avoidable admissions, where the condition that might lead to hospitalizations can be prevented or treated in an outpatient setting (Segal et al., 2014). For people with intellectual disability who display challenging behavior without a diagnosis of mental ill health, the recommended treatment pathway is primarily the assessment of physical health needs as well as a functional assessment of the behavior, and the delivery of a behavioral intervention such as Positive Behavior Support (Ali et al., 2014; Lloyd & Kennedy, 2014; National Institute for Health and Care Excellence, 2015). In addition, a stepped-model approach has been recently proposed, which recommends that the assessment and management of challenging behavior should be tailored to the severity of the behavioral presentation and the risks it poses within a multidisciplinary service pathway (Hassiotis & Rudra, 2022).

Qualitative research should also be conducted among patients and service providers, adding essential information on the implementation and acceptability of the interventions. Crisis care services for people with intellectual disabilities vary considerably, and understanding which factors contribute to best practise in crisis care would be essential to develop measures of model fidelity and to monitor adherence (Crisis resolution team Optimisation and RElapse prevention, Lloyd-Evans et al., 2016, 2018; Morant et al., 2017).

In addition, it would also be useful to compare how crisis care impacts patients living independently/with family versus people in other settings. Future research should also include reliable measurement of satisfaction with services and quality of life of patients to gather sufficient data, with longer follow-up periods to examine the longer-term effects of crisis care. Furthermore, future studies should investigate the impact of crisis care on different subgroups of this population. For example, Lunsky and Balogh (2010) reported that males and young adults are at particularly high risk of hospital admissions. Moreover, Cowley et al. (2005) showed that schizophrenia spectrum and other psychotic disorders and mild intellectual disability are significant predictors of psychiatric hospitalization. Modi et al. (2015) also demonstrated that those with aggression and psychiatric polypharmacy have a higher rate of using psychiatric hospitalization services. Therefore, it is possible that certain subgroups of this population may benefit more from the interventions. While the current review only examines the impact of crisis care on adults, future reviews could also extend the sample to children and adolescents with intellectual disabilities and mental illness. Finally, future trials could consider an appropriate assessment of the cost-effectiveness of crisis interventions for this population.

## CONCLUSION

Results from this review provide encouraging preliminary evidence regarding the effectiveness of crisis interventions in reducing psychiatric admissions among adults with intellectual disabilities and mental illness and/or challenging behavior. There are also positive results for other outcomes such as challenging behavior and psychological and social functioning. However, the concerns around methodological shortcomings of the existing literature are significant and preclude any definite conclusions. Specific crisis interventions need to be evaluated through controlled, well-powered studies in future research.

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