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1 **Crisis Planning Interventions for People with Psychotic Illness or Bipolar Disorder: A**
2 **Systematic Review and Meta-Analyses**

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4 Lloyd-Evans

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6

7 **Abstract**

8 **Background**

9 Mental health services lack a strong evidence base on the most effective interventions to
10 reduce compulsory admissions. However, some research suggests that crisis planning
11 interventions (including advance statements and joint crisis plans) may be beneficial.

12

13 **Aims**

14 This review aimed to synthesise evidence from RCTs on the effectiveness of crisis planning
15 interventions in reducing rates of compulsory hospital admissions for people with psychotic
16 illness or bipolar disorder, compared with usual care.

17

18 **Method**

19 Systematic searches of six online databases were conducted in October 2018. The primary
20 outcome was compulsory psychiatric admissions and secondary outcomes included other
21 psychiatric admissions, therapeutic alliance, perceived coercion and cost effectiveness.
22 Trials were assessed for bias using the Cochrane Collaboration Tool.

23

24 **Results**

25 The search identified 1,428 studies and five RCTs were included in the review. One study
26 had high risk of bias due to incomplete primary outcome data. Random effects meta-
27 analysis showed a 25% reduction in compulsory admissions among those receiving crisis
28 planning interventions compared with usual care (pooled estimate from five studies: RR
29 0.75, 95%CI 0.61-0.93, p=0.008). There was no statistical evidence that the intervention
30 reduced the risk of voluntary psychiatric admissions or combined voluntary and compulsory
31 admissions. Few studies assessed other secondary outcomes.

32

33 **Conclusions**

34 Our meta-analysis suggests that crisis planning interventions substantially reduce the risk of
35 compulsory admissions among individuals with psychotic illness or bipolar disorder. Despite
36 several common components, the interventions varied in their content and intensity across
37 the trials. The optimal model of crisis planning interventions requires further investigation,
38 as does the implementation of these interventions in routine clinical practice.

39

40 PROSPERO registration number: CRD42018084808

41

42

43 Introduction

44 The number of people compulsorily admitted to psychiatric hospitals in England is rising
45 each year (1), with increases also observed in several other European countries (2, 3). Whilst
46 compulsory admission may help mitigate short-term risks, there are negative repercussions
47 for both the individual service users and healthcare services (4-8). The reasons for this rise
48 are complex and debated, but likely to include socioeconomic, legal and service-related
49 factors (9). mental health services lack a strong evidence base on the most effective
50 interventions to reduce compulsory admissions. However, crisis planning interventions have
51 been identified as being potentially beneficial (10, 11).

52
53 Multiple types of crisis plan exist, which vary between jurisdictions in terminology, content
54 and legal enforceability. In England, advance decisions document a person's instructions for
55 healthcare they want to refuse in the future, if they lose capacity for making treatment
56 decisions at that time, and are legally binding (12). However, if service users have been
57 admitted under the Mental Health Act 2007, doctors' statutory authority to provide
58 treatment overrides advance decisions (13). In contrast to advance decisions, advance
59 statements can be used to describe a person's preferences for the care they would like to
60 receive, as well as treatments they want to refuse, but are not legal documents (14). Joint
61 crisis plans are a type of advance statement which are developed collaboratively between
62 the service user and mental health professionals and are also not legally enforceable. In
63 Scotland, advance decisions are known as advance directives, but are not legally binding
64 (15). In the US, Psychiatric Advance Directives provide documentation of people's
65 preferences for future mental health treatment during a crisis, with legislation varying by
66 state (16).

67
68 Crisis planning interventions may help to prevent relapse, for example by promoting better
69 self-management, or may reduce the need for hospitalisation by encouraging prompt help
70 seeking or improved community service responses. The presence of crisis plans may also
71 make service users and clinicians more willing to accept voluntary hospital admissions when
72 a crisis occurs, due to greater awareness of indicators of relapse and increased confidence
73 on the part of the service user that their treatment preferences will be respected once
74 admitted, even if capacity is lost.

75
76 A previous review of interventions to reduce compulsory psychiatric admissions found that
77 crisis plans were the only intervention which appeared to be effective (17), with pooled
78 estimates for community treatment orders (three RCTs), compliance enhancement (two
79 RCTs) and integrated treatment (four RCTs) showing no significant effects. However, this
80 review gave little information on the core components of the crisis planning interventions
81 and did not examine important secondary outcomes, including voluntary admissions, length
82 of stay and therapeutic alliance. We therefore conducted a thorough up-to-date systematic

83 review of randomised controlled trials examining crisis planning interventions for people
84 with psychotic illness or bipolar disorder. The primary review question examines whether
85 crisis planning interventions are effective for reducing compulsory admissions among
86 people with psychotic illness or bipolar disorder, compared with treatment as usual.
87 Secondary review questions examine the impact of crisis planning interventions on other
88 outcomes of interest including voluntary admissions, duration of inpatient treatment,
89 psychiatric functioning, quality of life, therapeutic alliance, service user engagement,
90 perceived coercion, adverse effects, and cost effectiveness.

91

92 **Method**

93 The protocol for this review was prospectively registered on PROSPERO (registration:
94 CRD42018084808) and followed the PRISMA guidelines (3).

95 **Eligibility criteria and selection of studies**

96 This review sought to identify RCTs examining crisis planning interventions for people with
97 psychotic illness or bipolar disorder. The inclusion criteria were 1) Studies of adults (aged 16
98 and over) who had a diagnosis of a psychotic illness or bipolar disorder with or without
99 psychotic symptoms. Studies including mixed populations of service users from secondary
100 care mental health services were eligible if the majority of participants had a diagnosis of a
101 psychotic illness or bipolar disorder; 2) Studies which examined any form of crisis planning
102 intervention which involved the service user in decisions regarding future treatment
103 preferences (including advance decisions, advance directives, joint crisis plans and other
104 relevant interventions). Interventions that included follow-up meetings were eligible, if the
105 primary aim of these meetings was to review the crisis plan. Interventions where crisis
106 planning was not the primary focus were not eligible; 3) Studies were eligible if the
107 comparison group was treatment as usual, defined as the standard care in that setting.
108 Studies which compared a crisis planning intervention with a different active intervention
109 were not eligible; 4) Only randomised controlled trials (published or unpublished) were
110 eligible, including cluster randomised controlled trials. There were no exclusion criteria
111 based on language or date of publication.

112 The primary review outcome was compulsory hospital admission for psychiatric care. The
113 secondary outcomes of interest were: 1) voluntary hospital admission for psychiatric care, 2)
114 any hospital admission for psychiatric care, 3) duration of inpatient psychiatric treatment, 4)
115 global and specific psychiatric symptoms, 5) psychiatric functioning, 6) quality of life, 7)
116 therapeutic alliance, 8) service engagement, 9) perceived coercion, 10) adverse effects and
117 11) cost effectiveness. These outcomes could be assessed at any time point.

118 **Data sources and selection of studies**

119 The following databases were searched from inception to October 16th 2018: Cochrane
120 Central Register of Controlled Trials (CENTRAL), CINAHL, MEDLINE, EMBASE, PsycINFO and

121 the International Standard Randomised Controlled Trial Number (ISRCTN) registry. The
122 search strategy was based around terms for crisis plans or advance directives, mental
123 disorders and RCTs. The full search strategy is available in Appendix 1. Conference
124 proceedings from the European Psychiatric Association (EPA), World Psychiatric Association
125 (WPA), the European Network for Mental Health Service Evaluation (ENMESH) and the
126 American Psychiatric Association (APA) from 2011 onwards were hand-searched for relevant
127 RCTs. Forward and backward citation tracking were conducted for all eligible studies and for
128 two relevant systematic reviews (17, 18), to identify any additional relevant studies.

129 Title and abstract screening and full text screening were conducted by two reviewers
130 independently. Following title and abstract screening, the full texts of all articles identified
131 as potentially relevant by either reviewer were obtained. Any discrepancies following full
132 text screening were resolved through discussion with a third author when necessary.
133 Relevant data for the review (relating to the participants, setting, method, intervention,
134 comparison and outcomes) were extracted into a data extraction table and checked by a
135 second reviewer. Authors of the papers were contacted to request additional information if
136 needed, if this related to the primary outcome of compulsory hospital admission.

137 **Risk of bias assessment**

138 Risk of bias was assessed for each study using the Cochrane Collaboration Risk of Bias Tool
139 (19, 20) for the following domains: sequence generation, allocation concealment, blinding of
140 outcome assessors, incomplete outcome data and selective reporting. Two reviewers
141 conducted risk of bias assessments for all papers independently and any discrepancies were
142 resolved through discussion, including a third author if necessary.

143

144 **Data synthesis**

145 The number of participants with and without the primary outcome of compulsory
146 psychiatric admission was extracted from all studies for the intervention and control groups
147 separately. A pooled risk ratio (RR) with 95% CI confidence interval (CI) was calculated
148 through random effects meta-analysis using the Mantel-Haenszel method. Heterogeneity
149 between trials included in the meta-analyses were investigated by visual inspection of the
150 forest plots and calculation of the I^2 statistic. Where there was indication of heterogeneity
151 (e.g. I^2 statistic higher than 50%), the study quality, clinical population and intervention
152 content were considered as possible explanatory factors. If any studies eligible for the meta-
153 analysis included more than one crisis planning intervention condition, we combined the
154 active treatment groups into a single arm for comparison against the control group, in line
155 with the recommendations in the Cochrane Handbook for Systematic Reviews of
156 Interventions (20). A subgroup analysis was planned to pool studies or treatment conditions
157 in which the crisis planning intervention was facilitated by a healthcare professional, and
158 those where it was not facilitated by a healthcare professional (e.g. by a former service
159 user).

160 The main meta-analyses were conducted including only participants for whom outcome
161 data was available (i.e. complete case analysis). Such analysis assumes that data are missing
162 at random. Sensitivity analyses were performed to investigate the robustness of findings to
163 changing assumptions regarding the mechanism of missing data, as recommended in the
164 Cochrane Handbook (20). Four different assumptions were made to complete the missing
165 data: first, that participants lost to follow-up had no compulsory admissions; second that
166 they had the same rate of compulsory readmissions as other participants in the same arm of
167 the same trial; third that the proportion of readmissions was 10 percentage points lower
168 among those lost to follow-up, and finally that the proportion of readmissions was 10
169 percentage points higher among those lost to follow-up. An additional sensitivity analysis
170 excluded studies with high risk of bias in any domain from the meta-analysis. Finally, an
171 influence analysis was conducted in which each study was removed in turn from the meta-
172 analysis. If sufficient (10 or more) studies were included in any meta-analysis, a funnel plot
173 was used to investigate potential publication bias (21).

174 Random effects meta-analysis was also used to pool data for each of the secondary
175 outcomes, if three or more comparable studies were identified. Risk ratios were pooled for
176 dichotomous outcomes and standardised mean differences were calculated and combined
177 for continuous outcomes. If insufficient comparable studies were identified for any planned
178 analyses, narrative synthesis was used. Key components of crisis planning interventions
179 from the included studies were also described and compared.

180 **Results**

181 The search strategy identified 1,428 studies, of which 1,023 remained after duplicates were
182 removed. Through title and abstract screening, 964 records were excluded. Full-texts for the
183 remaining 59 studies were obtained and assessed for eligibility. Five studies met the
184 inclusion criteria and were included in the review. The study selection process is shown in
185 Figure 1.

186 *[Insert Figure 1 here]*

187 **Study Characteristics**

188
189 Key characteristics of the five included studies are given in Table 1. Three trials only included
190 participants with psychotic disorders or bipolar disorder (10, 11, 22), whilst the other two
191 trials included mixed populations from secondary care mental health services (23, 24). All of
192 the trials reported a majority diagnosis of schizophrenia or schizophrenia-like disorders.
193 Follow-up periods for the trials ranged from 12 to 24 months. In all five trials, the crisis
194 planning intervention was compared with treatment-as-usual, however in one trial the
195 control group also received an information leaflet about local mental health services and
196 the Mental Health Act (10).

197

198 *[Insert Table 1 here]*

199

200 There was some variation in the components of the crisis planning interventions across the
201 included trials. In two trials, the intervention commenced while participants were
202 psychiatric inpatients (23, 24); the other three trials recruited outpatients with previous
203 psychiatric admissions (10, 11, 22). One trial (24) examined the effectiveness of a type of
204 advance statement, in which participants completed a booklet consisting of seven
205 statements on future treatment preferences, with support from researchers. Three trials
206 examined joint crisis planning interventions (10, 11, 22). One of these included two
207 intervention groups; participants could be randomised to a clinician-facilitated crisis plan
208 (i.e. joint crisis plan) or a patient-advocate facilitated crisis plan (11). In the other two trials
209 of joint crisis plans (10, 22), the crisis plan was facilitated by a healthcare professional who
210 was part of the research team, and discussed at one or more meetings with members of the
211 service user's clinical team, and a family member or friend if they wished.

212 Finally, one trial examined a crisis planning intervention which was facilitated by a
213 healthcare professional (psychologist) without involvement from the service user's clinical
214 team (23). This trial implemented a higher intensity crisis planning intervention, in which
215 participants in the intervention group attended a varying number of individualised psycho-
216 education sessions focused on identifying behaviours prior to crisis and developed crisis
217 cards consisting of future treatment preferences. In addition, they received four-weekly
218 telephone monitoring, to review the crisis cards and facilitate the detection of early signs of
219 crisis identified in the previous psychoeducation sessions.

220 A summary of the intended components of the interventions are given in Table 2, and a
221 detailed description of the content of each intervention and control condition is reported in
222 Appendix 2. None of the crisis plans examined in the included RCTs were legally enforceable.

223 *[Insert Table 2 here]*

224 **Risk of bias in included studies**

225

226 Figure 2 summarises the risk of bias in the included trials, assessed using the Cochrane
227 Collaboration Tool (19). Three trials had low risk of bias for sequence generation (10, 22, 24)
228 and two had low risk of bias for allocation concealment (10, 22). The remaining studies had
229 unclear risk of bias in these domains, with insufficient detail provided in trial reports. None
230 of the trials were able to blind the participants or staff, due to the nature of the
231 intervention, so this was not included in the risk of bias assessment. However, blinding of
232 outcome assessors was examined. Three of the five trials did not blind outcome assessors
233 to group allocation (11, 23, 24), which could lead to risk of detection bias. However, the
234 impact of detection bias on the primary outcome of this review (compulsory hospital
235 admissions) should be limited, as this was assessed or cross-checked with hospital records in
236 all included studies. Risk of bias was therefore assessed separately for the primary and

237 secondary outcomes, and studies in which no blinding was performed were rated as having
238 unclear risk of bias for the primary outcome, and high risk of bias for the secondary
239 outcomes.

240 *[Insert Figure 2 here]*

241 In four studies, the risk of attrition bias was low. The primary outcome of compulsory
242 admissions was largely collected from hospital records meaning that missing data for the
243 primary outcome was less than 4% in four studies (10, 11, 22, 24). However, in one study
244 (23), readmission data was only reported for participants who completed the outcome
245 assessments. This study was rated as having high risk of attrition bias as loss to follow-up
246 was unbalanced between groups (32.8% from the intervention group and 14.3% from the
247 control group).

248 **Compulsory hospital admissions**

249 All five trials reported the number of participants who had a compulsory admission or
250 readmission to hospital during the follow-up period, which ranged from 12 to 24 months.
251 Based on complete case analysis, the proportion of participants experiencing compulsory
252 admissions in each study ranged from 13% to 28% in the intervention groups and 20% to
253 43% in the control groups.

254 The results of all five studies were pooled using random effects meta-analysis, as shown in
255 Figure 3. The pooled estimate showed a 25% reduction in compulsory admissions among
256 those receiving crisis planning interventions compared with those who did not receive the
257 intervention (RR 0.75, 95%CI 0.61-0.93, $p=0.008$). There was no evidence of moderate or
258 substantial heterogeneity (20) ($I^2=0\%$; $\text{Chi}^2=3.94$, $df=4$ $p=0.41$). A subgroup analysis was
259 conducted to pool studies (10, 22, 23) or treatment conditions (11) in which the crisis
260 planning intervention was facilitated by a healthcare professional, which gave a similar
261 estimate (RR 0.67, 95%CI 0.49-0.92; based on four studies; see Figure 4).

262 *[Insert Figures 3 and 4 here]*

263 There were only two studies which examined crisis-planning interventions that were not
264 facilitated by a healthcare professional, so these results were not pooled using meta-
265 analysis. There was no evidence that the crisis planning intervention facilitated by
266 researchers in Papageorgiou et al.'s (24) trial was effective in reducing compulsory hospital
267 admissions. In Ruchlewska et al.'s (11) trial, 16% of participants receiving patient advocate-
268 facilitated crisis plans were admitted under court order in the follow-up period, compared
269 with 10% in the clinician-facilitated crisis plan group and 26% in the control group.

270 Sensitivity analyses were conducted to investigate the robustness of the findings (see
271 Appendix 3). First, the proportion of compulsory admissions was calculated under four
272 different assumptions for missing outcome data. All four analyses gave comparable findings

273 to the main results. The pooled estimate was RR 0.70 (95%CI 0.54-0.90) under the
274 assumption that there were no compulsory admissions among participants with missing
275 follow-up data and RR 0.74 (95%CI 0.61-0.91) under the assumption that participants with
276 missing follow-up data had the same rate of compulsory admissions as participants with
277 follow-up data in the same arm of that trial. Assuming that the rate of compulsory
278 readmissions was either 10 percentage points lower or higher among participants with
279 missing data, the pooled estimates were RR 0.72 (95%CI 0.57-0.92) and RR 0.77 (95%CI 0.63-
280 0.94) respectively.

281 An additional sensitivity analysis was conducted to exclude studies with high risk of bias
282 from the meta-analysis. Only one study (Lay et al. (23)) had high risk of bias in any domain
283 relating to the primary outcome. After excluding this study, the pooled effect was slightly
284 attenuated (RR 0.78, 95%CI 0.60-1.01). Finally, influence analyses were conducted to
285 remove each study in turn from the pooled estimate. As described previously, excluding Lay
286 et al. slightly attenuated the relationship, but other influence analyses did not alter
287 conclusions (see Appendix 3 for full details).

288 **Secondary outcomes**

289 ***Other hospital admissions and length of admissions***

290 Three studies reported the prevalence of voluntary hospital admissions (11, 23, 24) and
291 three reported the overall prevalence of admissions to psychiatric care (i.e. including both
292 compulsory and voluntary admissions) (10, 11, 22). Pooled estimates for these secondary
293 outcomes showed no evidence that crisis planning interventions reduced the risk of
294 voluntary admissions (RR = 1.17; 95% CI, 0.91-1.50; see Figure 5) or any psychiatric
295 admissions (RR = 0.90, 95%CI 0.74-1.09; see Figure 6).

296

297 *[Insert Figures 5 and 6 here]*

298

299 Only two studies reported data on duration of admissions among those who had received
300 an admission during the study period. One of these studies (Henderson et al. (10)) reported
301 that there was no difference in length of compulsory admissions between the intervention
302 and control groups, and the other (Ruchlewska et al. (11)) reported no difference in overall
303 length of admissions (compulsory and voluntary combined). Four of the studies compared
304 duration of admissions in the intervention and control groups for their entire samples (i.e.
305 also including those who had not received an admission during the study period as having
306 zero days of admission), using means, medians or counts. Of these four studies, two found
307 no difference between the intervention and control groups for the duration of compulsory
308 or voluntary admissions (22, 24). In contrast, two studies reported that the mean length of
309 compulsory admissions was lower for the intervention than the control group, but there was
310 no difference in the length of any admissions (10) or voluntary admissions (23).

311

312 ***Psychiatric functioning and quality of life***

313

314 One study reported on psychiatric symptoms and functioning at 12 months follow-up (24),
315 and found no difference between the intervention and control groups. Lay et al. (23) did not
316 report psychiatric functioning at 24 months, but found no difference in functioning in an
317 interim analysis at 12 months post-randomisation (23, 25). Finally, one study examined
318 service users' insight into their psychiatric symptoms (11), again reporting no difference
319 between the intervention and control groups. None of the trials included in this review
320 reported quality of life.

321

322 ***Therapeutic alliance, service engagement and perceived coercion***

323

324 Thornicroft et al. (22) reported no evidence of a difference in perceived coercion, service
325 engagement or clinician-rated therapeutic alliance between groups. However, there was
326 evidence for a slight improvement in service user-rated therapeutic relationship, assessed
327 by the Working Alliance Inventory Client Version, in the intervention group compared with
328 controls after adjusting for variables associated with trial design and loss to follow-up (mean
329 difference -1.28, $p=0.049$, adjusted for baseline WAIC score, site, number of previous
330 admissions and diagnosis) (26). Ruchlewska et al. (11) reported no difference in service
331 engagement or working alliance (either service user or clinician rated) between the
332 intervention arms and the control group. Lay et al. (23) did not report these outcomes at 24
333 months, but found no group differences in perceived coercion at 12 months post-
334 randomisation (25). Two trials did not report any outcomes related to therapeutic alliance,
335 service engagement or perceived coercion (10, 24).

336

337 ***Adverse effects***

338

339 No studies reported any specific assessment of adverse events.

340

341 ***Cost effectiveness***

342

343 Cost effectiveness was not reported in any of the main trial papers. However, economic
344 evaluations were published separately for two of the included trials (10, 22). For the
345 Henderson et al. (10) trial, cost effectiveness acceptability curves suggested that there was
346 over 78% probability that joint crisis plans were more cost effectiveness than usual care
347 (27). The economic evaluation of the Thornicroft et al. (22) trial found a similar overall
348 probability (80%) that joint crisis plans were more cost effective than usual care (28).

349

350 ***Discussion***

351 This systematic review identified five RCTs which examined the effectiveness of crisis planning
352 interventions for adults with psychotic illness or bipolar disorder. A meta-analysis of these
353 studies showed a 25% reduction in risk of compulsory hospital admissions among those
354 receiving crisis planning interventions compared with usual care, a finding which was found
355 to be robust in multiple sensitivity analyses. In contrast, there was no evidence for a reduction
356 in voluntary admissions or total psychiatric admissions, and the pooled estimate for voluntary
357 admissions showed a trend towards increased risk following crisis planning interventions. It
358 may be that crisis planning interventions do not prevent admissions entirely but can reduce
359 compulsory admissions rates by shifting some of these to voluntary admissions.

360 Our findings are in keeping with a previous systematic review which examined interventions
361 to reduce compulsory psychiatric admissions (17). This review identified four RCTs
362 investigating the effectiveness of crisis planning interventions (including advance
363 statements and joint crisis plans), with searches conducted in April 2015. Our review
364 updates this previous review, including one additional trial of an intensive crisis planning
365 intervention (23), and provides further details on the characteristics of the interventions
366 and the secondary outcomes of these trials. These details are important for clinicians
367 considering implementing crisis planning interventions or for researchers planning future
368 studies in this area. Implications for research and clinical practice are described in the final
369 section of this discussion.

370 Although the pooled estimate shows that crisis planning interventions were effective in
371 reducing compulsory admissions, there was variation between individual studies both in the
372 characteristics and the effectiveness of the crisis planning interventions. All of the included
373 RCTs found a trend for a positive effect of crisis planning interventions but this was not
374 statistically significant in three of the five original studies. The meta-analysis is therefore an
375 important contribution to the evidence base as consideration of the trials individually might
376 have led to more cautious conclusions about the effectiveness of crisis planning
377 interventions.

378 Thornicroft et al. (22) found no evidence that their intervention was effective in reducing
379 compulsory admissions. This is the largest included study and was assessed to have low risk
380 of bias in all domains, so the null finding could reduce confidence in the overall positive
381 conclusion from our meta-analysis. Thornicroft et al. themselves considered potential
382 explanations for their null finding, which was in contrast with the Henderson et al. (10) trial
383 that followed a highly similar protocol in a smaller sample. In the Thornicroft et al. trial, it
384 was found that almost 50% of the crisis plans were developed during usual clinical review
385 meetings as staff had not made themselves available to discuss the crisis plan at a specific
386 time. Qualitative interviews conducted with participants in Thornicroft et al.'s trial
387 suggested that this impacted on the service users' experiences, as many could not
388 remember the crisis planning meeting as being distinct from other routine meetings, and
389 also commented that the content of their plans was not following during subsequent crises.

390 Problems with implementation of the crisis planning intervention were also reported in
391 other studies, for example, Ruchlewska et al. reported that only 57% of the clinician-
392 facilitated crisis plans were completed (11). It is notable that the pooled estimate showed a
393 positive impact of crisis planning interventions given these implementation challenges.

394 **Methodological strengths and limitations**

395 This review provides an updated account of the effects of crisis planning interventions for
396 people with psychotic illness or bipolar disorder, and highlights that these interventions may
397 be effective in reducing risk of compulsory hospital admissions. However, the conclusions of
398 this review are limited by the small number of studies included, particularly in some
399 subgroup analyses, and the fact that all included trials were conducted in Europe. The
400 review was limited to RCTs because these represent the gold standard when evaluating
401 interventions (20). Observational studies and studies using routine hospital data may also
402 generate valuable evidence about the effectiveness and implementation of these
403 interventions outside experimental conditions and could be included in future reviews. A
404 strength of this review was the inclusion of secondary outcomes such as quality of life,
405 psychiatric functioning, perceived coercion and therapeutic alliance, which were not
406 examined in the earlier systematic review of interventions to reduce compulsory admissions
407 (17). However, these were not widely assessed in the included trials, thus limiting our ability
408 to draw conclusions about the effectiveness of crisis planning interventions for these
409 outcomes.

410
411 Several trials included in this review reported that a high proportion of the service users
412 approached were either ineligible or declined to participate. Low rates of recruitment are
413 common for trials on psychotic illness or bipolar disorder, where there is often a multitude
414 of factors that can prevent a person from taking part in research (29). Nevertheless,
415 recruitment rates can be an important indicator of the acceptability of an intervention, and
416 low recruitment rates may also suggest that participants are not representative of the target
417 population. Three out of the five trials included in this review reported a lower number of
418 compulsory admissions in the control arm than was initially predicted from local routine
419 data, which may be due to systematic differences between those who agreed to participate
420 in the trials and those who did not. Only studies conducted in Europe were identified so our
421 findings may have limited generalisability to other settings. In addition, changes in clinical
422 practice and service funding over time may limit applicability of studies such as
423 Henderson et al.'s (published in 2004) to the current context.

424 Our review focused on crisis planning interventions for individuals with psychotic disorders
425 and bipolar disorder, meaning that we are unable to draw conclusions about the
426 effectiveness of crisis planning interventions for other groups at risk of compulsory
427 admission. However, there is very little evidence for other disorders. One previous pilot RCT
428 examined crisis planning interventions for individuals with personality disorder (30) but did

429 not include compulsory admissions as an outcome. In addition, none of the RCTs included in
430 this review examined advance decisions which were legally binding, so it is not clear what
431 impact the legal basis would have on risk of compulsory hospital admissions.

432

433 Loss to follow-up is also a common problem for RCTs; however, this had limited impact on the
434 primary outcome of this review which was collected from routine records for the majority of
435 the trials. The exception to this is Lay et al. (23), who only had readmission data for
436 participants who completed the follow-up interviews. This study was rated as having high risk
437 of attrition bias as there was substantial loss to follow-up which was unbalanced between
438 study groups. However, we examined multiple different strategies for imputing missing data
439 in sensitivity analyses and these did not alter the overall conclusions, so we believe our
440 findings are robust to the missing data in this study.

441 All studies had low or unclear risk of bias in the other domains assessed, with the exception
442 of blinding of outcome assessors. In addition, no studies included blinding of participants or
443 study personnel, due to the nature of the intervention. Lack of blinding is unlikely to lead to
444 bias for the primary outcome, for which data on compulsory admissions was extracted from
445 medical records but may have led to bias in the secondary outcomes.

446 **Implications for research and clinical practice**

447 Rates of compulsory admissions have been rising in the UK and several other European
448 countries (31). The recent Independent Review of the Mental Health Act emphasised the
449 need to reduce compulsion and for individuals to have greater choice and autonomy in their
450 care (9). Our systematic review was part of the evidence considered for the Mental Health
451 Act review, which recommended that crisis planning interventions (referred to as Advance
452 Choice Documents) should be used, and that “in the future, a request for a treatment that
453 might be less than optimal, but still possible, should be honoured” (p 21) (9).

454 In this systematic review and meta-analysis, we found that crisis planning interventions are
455 effective for reducing compulsory admissions among adults with psychotic illness or bipolar
456 disorder who have experienced previous psychiatric admissions or crisis contacts with
457 mental health services. Economic evaluations of two trials also reported a high likelihood
458 that crisis planning interventions are cost effective. Therefore, our review highlights the
459 importance of offering support to service users to make crisis plans if they have had
460 previous compulsory admissions or are identified as being at high risk. This is particularly
461 important as a recent systematic review of RCTs of any interventions to reduce compulsory
462 psychiatric admissions (17) found no evidence for the effectiveness of other interventions
463 including community treatment orders, compliance enhancement or integrated treatment.

464 Greater knowledge of the mechanisms by which crisis planning interventions reduce
465 compulsory admissions is required. Although data for secondary outcomes was limited in
466 this review, individual studies which assessed these outcomes reported no impact on

467 psychiatric functioning, perceived coercion or service engagement, and minimal impact on
468 service-user reported therapeutic alliance. The lack of substantial impact on therapeutic
469 alliance was unexpected but may relate to the fact that only two included studies assessed
470 therapeutic alliance (11, 22) and, as discussed above, in both of these studies the clinicians'
471 commitment to the crisis planning intervention was found to be limited. There was also no
472 evidence that crisis planning interventions reduced the risk of voluntary psychiatric
473 admissions; in fact, there was a trend for these to be higher among participants in the
474 intervention than control groups. Therefore, rather than preventing hospital admissions,
475 crisis plans may reduce compulsory admissions by making service users and/or clinicians
476 more willing to consider voluntary admission when a crisis occurs. Potential reasons for this
477 could include greater awareness and acceptance that relapse indicators for admission are
478 occurring, or greater confidence by the service user that their views and treatment
479 preferences will be respected following admission, but future research in this area is
480 required.

481 The optimal models of crisis planning interventions also requires further investigation,
482 including the extent of clinician involvement and ongoing monitoring required for
483 interventions to be effective. One study included in this review (23) incorporated relatively
484 intensive ongoing monitoring within the intervention, but it is unclear the extent to which
485 additional monitoring occurred in the other clinician-facilitated crisis planning interventions.
486 Fidelity to a core set of intervention components may enhance the effectiveness of crisis
487 planning interventions but stakeholder consultations and future comparison studies of
488 different models of crisis planning intervention are required to determine the most effective
489 models. Studies should also examine whether the effectiveness of crisis planning
490 interventions differs based on ethnicity, gender or other characteristics of service users. This
491 was not examined in the majority of trials included in this review despite, for example,
492 known higher risk of compulsory admissions among people from Black, Asian and Minority
493 Ethnic backgrounds in England and other countries (32, 33).

494 Several studies faced challenges in the implementation of the crisis planning intervention
495 which may have limited their effectiveness. It is essential that future research examines and
496 addresses these barriers to intended delivery, for example taking a behaviour-change
497 perspective to address clinician engagement.

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501 **Commentary by Patrick Nyikavaranda and Rachel Rowan Olive from the Lived Experience**
502 **Working Group in the NIHR Mental Health Policy Research Unit**

503

504 It is reassuring that the study concludes with the observation that in some cases, crisis
505 planning interventions substantially reduce the risk of compulsory admissions. Better
506 understanding of crisis planning amongst service users may increase willingness to plan.

507

508 It would be of note to see how the Triangle of Care (<https://carers.org/article/triangle-care>)
509 can increase likelihood of having carers and service users increase participation in joint crisis
510 planning. However, it must be acknowledged that there are a lot of individuals who use
511 services who do not want their carers involved in joint crisis planning and provision should
512 be given to support them as much as possible to take up crisis planning.

513

514 We note with caution that two studies showed an economic benefit. We hope that should
515 larger studies on cost effectiveness show that joint crisis planning brings about an
516 economic benefit then those savings are invested into better and radical crisis support
517 interventions, both pre and post crisis.

518

519 While a 25% decrease in compulsory admissions is significant, the lack of effect on overall
520 and voluntary admissions also matters. Having experienced both voluntary and compulsory
521 admissions, voluntary admissions are often de facto detentions - "Come in voluntarily or we
522 will section you" - lacking legal safeguards.

523

524 Further cause for caution comes from the scope of the systematic review - limited to
525 patients with bipolar disorder or psychosis - and of the included studies. Although BAME
526 service users are disproportionately likely to be detained, most studies did not break down
527 results by race. Moreover, the three English studies largely predate austerity, the latest
528 being Thornicroft et al (2013), the only study showing no impact on detentions. Detentions
529 rose by 40% between 2004/5 and 2015/16

530 (https://www.cqc.org.uk/sites/default/files/20180123_mhadetentions_report.pdf); our
531 experience is that compulsory admissions often relate directly to lack of resources,
532 intersecting with specific needs. For instance, one author was sectioned despite consenting
533 to admission to a community-based women's crisis house or women's ward as per her
534 advance directive. Both were full; she was detained to a mixed-gender ward.

535

536 Significant further research is therefore needed before drawing firm conclusions from this
537 review.

538

539

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573 **Figure legend**

574 Figure 1: PRSIMA flow diagram

575 Figure 2: Risk of Bias Assessment

576 Figure 3: Forest plot showing the risk of compulsory hospital admissions among those
577 receiving a crisis planning intervention compared with controls

578

579 Figure 4: Forest plot showing the risk of compulsory hospital admissions among those
580 receiving a clinician-facilitated crisis planning intervention compared with controls

581

582 Figure 5: Forest plot showing the risk of voluntary hospital admissions among those
583 receiving a crisis planning intervention compared with controls

584

585 Figure 6: Forest plot showing the risk of any hospital admissions among those receiving a
586 crisis planning intervention compared with controls

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